REDACTED

27199

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

FEB 01 1990
4WD-SISB

Mr. John Taylor, Chief
Land Protection Branch
Georgia Department of Natural Resources
205 Butler Street, SW
Atlanta, Georgia 30334

RE: NFRAP GEORGIA SITES

Dear Mr. Taylor:

This is to inform you that the Georgia CERCLIS sites listed below have been assigned No Further Remedial Action Planned (NFRAP) designations. The reason for the designations are the low Preliminary Hazardous Ranking System (HRS) scores calculated for each of the sites.

Please be advised that the NFRAP designations are based on information currently available and conditions and policies that currently exist.

GAD000640920	Columbus South WWTP
GAD003265527	Simmons Plating Works
GAD981004013	Davidson Mineral Properties Drum Dump
GAD000635476	Clifton Equipment Rental Landfill #2
GAD088935960	Prismo Universal Corporation
GAD064494040	Scholle Corporation
GAD980844161	Wilson Property
GAD065365603	Snyder Brothers, Inc.
GAD069194108	Crosby Stevens Company
GAD061022216	Gulfstream Aerospace Corporation
GAD000735688	Cyanamid Distribution Center
GAD070327267	Borden, Inc.

It is possible that in the future our investigation of a site may be reactivated if new information or policies warrant such an action.

Should you have any questions, please contact me at (404) 347-5065.

Sincerely,

MEV

Mario E. Villamarzo
Georgia Project Officer
Site Assessment Section

YELLOW

cc: Murray Warner, NUS

It is possible that in the future our investigation of a site may be reactivated if new information or policies warrant such an action.

Should you have any questions, please contact me at (404) 347-5065.

Sincerely,

Mario E. Villamarzo
Georgia Project Officer
Site Assessment Section

cc: Murray Warner, NUS

NUS CORPORATION
1927 LAKESIDE PARKWAY
SUITE 614
TUCKER, GEORGIA 30084
404-938-7710

SISB / SAS
C586-0-19
JAN 10 1990
EPA - REGION IV
ATLANTA, GA.

January 4, 1990

1-23-90
NFRAP
Janice P Thomas

Mr. A. R. Hanke
Site Investigation and Support Branch
Waste Management Division
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30365

Subject: Screening Site Inspection, Phase I
Prismo Universal Corporation
East Point, Fulton County, Georgia
EPA ID No. GAD 088935960
TDD No. F4-8910-42

Dear Mr. Hanke:

FIT 4 conducted a Phase I Site Screening Inspection at Prismo Universal Corporation in East Point, Fulton County, Georgia. The assessment included a review of EPA and state file materials, completion of a target survey and an offsite reconnaissance of the facility and surrounding area.

Prismo Universal Corporation is located at 2675 North Martin Street in East Point, Georgia (Refs. 1, p. 36; 2). This company was in operation from 1951 until 1984 when the operations were moved to Ball Ground, Georgia. Prismo Universal manufactured traffic markings, including paints and plastics, and industrial paints, including surface primers and top coats (Ref. 3). The current owner is Redland Prismo Corporation (formerly known as Prismo Universal Corporation) of Parsippany, New Jersey (Refs. 3, 4).

Prior to the facility's closing in 1984, Prismo Universal formulated resins by reacting ethylene glycol or glycerol with phthalic anhydride, with solvents (usually benzene-toluene at up to 40%) in order to make exterior paints (Ref. 5). The entire facility covers 1 city block (Ref. 3).

Wastes from these processes included paint waste in residue tanks, spent solvents, and caustic liquids (Ref. 3). The solvents were disposed of by M & M Chemical Company; the residue tank's contents were disposed of by SCA Services, Inc. during 1984 (Ref. 3). The quantities of these chemicals have varied throughout the company's history.

According to a 1982 Generator Annual Hazardous Waste Report, Prismo Universal produced 1,060,820 pounds of flammable liquid (benzene/toluene), 172,960 pounds of caustic waste liquids (sodium hydroxide) and 305,440 pounds of waste benzene liquids all of which were disposed of by Southeastern Waste Management at that time (Ref. 6). In 1984, Prismo Universal generated a total of 678.38 tons of solvents, heavy metals and bases which were disposed of by Stauffer (Tennessee), CWM (Alabama) and Tri-State (Alabama) (Refs. 7,8). The last hazardous waste produced by Prismo (before closing in 1984) involved the emptying of two 8,000-gallon caustic waste tanks and two 2,500-gallon wastewater tanks by Barton Environmental. The tanks were then cleared by Underwood Industrial and either sold or moved to Canton, Georgia, respectively (Refs. 3,9).

Prismo Universal filed a RCRA Part A on November 13, 1980 to store unused as well as spent chemicals (Ref. 3). In 1982, Prismo successfully petitioned for the withdrawal of their Part A, and the facility was granted small quantity generator status (Refs. 10, 11). One spill occurred in February of 1983 and resulted from a combination of events. Drums were dumped in a storage area in combination with caustic material that had overflowed from some tanks; all of which leaked out from under a damaged, diked area (Refs. 3,8). The waste from this spill went into a manhole on North Martin Street, across Norman Berry Road and into a small creek (Refs. 1,11). After receiving a notice of violation, Prismo excavated this area (Ref. 9). Also alkyd resins were repeatedly spilled at an off-loading ramp where transfer hoses connected to tanker trucks dripped (Refs. 3,5) This problem had persisted until the soil was saturated with this resinous material and solidified into a spongy consistency (Ref. 5). The company ceased operations on October 24, 1984, and closed its office on December 21, 1984 (Ref. 9).

The facility is located in the Piedmont Physiographic Province and hydrogelogic regime, which is typified by a residual soil of variable thickness overlying fractured, folded, and faulted metamorphic and igneous crystalline rocks (Ref 13, p. 1-11). The facility rests directly on the Clarkston Formation that consists of mica schist and amphibolite units (Ref. 14, p. 87). The source of groundwater in the area is the surficial, unconfined, residual soil crystalline rock aquifer system. Although water levels are quite variable in this aquifer, the water table is generally located at an average depth between 150 and 160 feet below land surface in the vicinity of the Prismo facility (Refs 3,15). The sandy clay and silty clay soil of the overlying residuum represents the layer with the lowest hydraulic conductivity between crystalline bedrock and the surface with typical values ranging between 1 X 10 -5 to 1 X 10 -7 cm/sec (Ref. 15). The net annual rainfall for this area is 7 0 inches, and the 1-year, 24 hour rainfall is 3.25 inches (Refs. 16, pp. 43, 63; 17, p. 93). There are no wells within 3 miles of the property (Ref. 3).

The surface water drainage from the facility will flow east to southeast into the storm drain system of East Point (Ref. 2). This storm drain system is connected to the South River Treatment Plant which is located on the South River (Ref. 18). Also, during conditions of overflow or heavy rains there is a possibility that the water path will continue overland east to southeast for 3500 feet into the South River (Ref. 2). There is no commercial fishing on the South River until the river runs into Lake Jackson, 40 miles to the south in Butts County (Ref. 19). There are no intakes on this river; however, there is recreational fishing (Refs. 20,19).

The entire city of East Point gets its water supply from the East Point water department, which has an intake on Sweetwater Creek, just north of Lower River Road (Ref. 21). This water intake is located outside of the 15-mile extended pathway (Refs. 21,2).

The Prismo Universal property is well fenced and looks very secure; thus, the closest people are the employees of the facility followed by nearby residents (Ref. 1, pp. 3,11,37). There are monitoring wells on the property. During the reconnaissence a pile of freshly excavated soil covered with plastic was in the center of the property (Ref. 1, pps. 4,9). Land on the west side of North Martin Street is commercial. Residents occupy properties to the east, and the closest resident is 100 feet from building #1 located on North Martin Street (Ref 1, pp. 11,37). There are numerous schools within the 4-mile radius of the property. However, only Russell High School, Harris Street School and Park Lane School are within a downhill slope of the property (Ref 2)

There is no discernible stressed vegetation either on the Prismo property or in the area (Ref. 1, p. 11). There are also no federal- or state-designated endangered plants or animals in this area (Ref. 22).

Based on the lack of groundwater and surface water targets and the attached reference material, FIT 4 recommends no further remedial action be taken on Prismo Universal. If you have any comments or questions about this assessment, please contact me at NUS Corporation.

Very truly yours,

Solomon Pollard

Solomon Pollard, Jr.
Project Manager

Approved:

Greg Schank

SPJ/jec

cc: Mario Villamarzo

REFERENCES

1. NUS Field Logbook No. F4-1761 for Prismo Universal Corporation, TDD No. F4-8910-42. Documentation of facility reconnaissance, October 19, 1989.

2. U.S. Geologic Survey, 7.5 minute series Topographic Quadrangle Maps of Georgia: Southwest Atlanta (Photorevised 1983), Southeast Atlanta (Photorevised 1983), Riverdale (Photorevised 1982), Jonesboro (Photorevised 1983), Ben Hill (Photorevised 1983), Fairburn (Photorevised 1983), scale 1:24,000.

3. Potential Hazardous Waste Site Identification Preliminary Assessment (EPA Form 2070-2) and attachments for Prismo Universal Corporation, East Point, Gerogia. Prepared by Gilda A. Knowles, Georgia Department of Natural Resources, January 13, 1986.

4. David Miller, Prismo Universal Corporation, telephone conversation with Georgia Department of Natural Resources, Environmental Protection Division. Subject: Current owners of Prismo Property.

5. Georgia Department of Natural Resources, Environmental Protection Division, Trip Report, by Ed Cook. July 20, 1983.

6. Generator Annual Hazardous Waste Report, Prismo Universal Corporation, March 15, 1983, Environmental Protection Agency, obtained from EPA file material on Prismo Universal Corporation (Atlanta, Georgia).

7. Georgial Annual Hazardous Waster Report, Prismo Universal Corporation, February 15, 1984, Gerogia Environmental Protection Division, obtained from EPA file material on Prismo Universal Corporation (Atlanta, Georgia).

8. Waste Management Data Sheet, Prismo Universal Corporation, February 10, 1984, Department of Natural Resources, Environmental Protection Devision, obtained from EPA file material on Prismo Universal Corporation (Atlanta, Georgia).

9. Georgia Department of Natural Resources, Environmental Protection Division, Trip Report, by Gwen Glass. February 20, 1985.

10. Harris Thiedman, Prismo Universal, letter to Moses N. McCall, III, Chief Land Protection Branch, Environmental Protection Division, December 3, 1982. Subject: Withdrawal of RECRA Part A.

11. John D. Taylor, Jr., Program Manager, Industrial & Hazardous Waste Management Program, Environmental Protection Division, letter to Harris Friedman, Prismo Universal Corporation, January 24, 1983. Subject: Withdrawal of RECRA Part A.

12. Georgia Department of Natural Resources, Environmental Protection Division, Trip Report, by Bert Langley. February 14, 1983.

13. H.E. LeGrand, Groundwater of the Piedmont and Blue Ridge Provinces in the Southeastern States, U.S. Geological Survey Circular 538, (Washington, D.C., 1967), p. 11.

14. Keith I. McConnell and Charlotte E. Abrams, Geology of the Greater Atlanta Region, (Georgia Geologic Survey, 1984), p. 126 (Plates I and II).

15. C. W. Cressler, C. J. Thurmond, and W. G. Hester, Groundwater in the Greater Atlanta Region, Information Circular 63, (Georgia Geologic Survey, 1983), p. 144 (Plate I).

16. U.S. Department of Commerce, Climatic Atlas of the United States, Washington, DC: GPO, June 1968) Reprint 1983, National Oceanic and Atmospheric Administration.

17. U.S. Department of Commerce, Rainfall Frequency Atlas of the United States, Technical Paper Number 40 (Washington, D.C.; GPO, 1963).

18. Phil Bingham, East Point Public Works Department, telephone conversation with Mary McDonald, NUS Corporation, September 14, 1989. Subject: East Point Sewer System.

19. Alfred Mauldin, Georgia Department of Natural Resources, telephone conversation with Cindy Gurley, NUS Corporation, August 30, 1989. Subject: Fishing in the South River.

20. Environmental Protection Division, Georgia Department of Natural Resources, Water Availability and Use, Flint River Basin (1986).

21. Superintendant, East Point Water Department, telephone conversation with Jeff Myers, NUS Corporation, April 14, 1989. Subject: Water source for East Point.

22. U.S. Fish and Wildlife Service, Endangered and Threatened Species, (Region 4, Atlanta, Georgia: 1987).

HAZARD RANKING SYSTEM SCORING SUMMARY

FOR

PRISMO UNIVERSAL CORPORATION
EPA SITE NUMBER GAD088935960
EAST POINT
FULTON COUNTY, GA
EPA REGION: 4

SCORE STATUS: IN PREPARATION

SCORED BY SOLOMON POLLARD
OF NUS
ON 11/27/89

DATE OF THIS REPORT: 12/19/89
DATE OF LAST MODIFICATION: 12/19/89

GROUND WATER ROUTE SCORE	:	3.27
SURFACE WATER ROUTE SCORE	:	7.27
AIR ROUTE SCORE	:	0.00
MIGRATION SCORE	:	4.61

HRS GROUND WATER ROUTE SCORE

CATEGORY/FACTOR	RAW DATA	ASN. VALUE	SCORE
1. OBSERVED RELEASE	NO	0	0
2. ROUTE CHARACTERISTICS			
DEPTH TO WATER TABLE	155 FEET		
DEPTH TO BOTTOM OF WASTE	10 FEET		
DEPTH TO AQUIFER OF CONCERN	145 FEET	1	2
PRECIPITATION	48.0 INCHES		
EVAPORATION	41.0 INCHES		
NET PRECIPITATION	7.0 INCHES	2	2
PERMEABILITY	1.0X10-6 CM/SEC	1	1
PHYSICAL STATE		3	3
TOTAL ROUTE CHARACTERISTICS SCORE:			8
3. CONTAINMENT		3	3
4. WASTE CHARACTERISTICS			
TOXICITY/PERSISTENCE:ASSIGNED VALUE,18			18
WASTE QUANTITY CUBIC YDS	2501		
DRUMS	0		
GALLONS	0		
TONS	0		
TOTAL	2501 CU. YDS	8	8
TOTAL WASTE CHARACTERISTICS SCORE:			26
5. TARGETS			
GROUND WATER USE		1	3
DISTANCE TO NEAREST WELL	> 3 MILES		
AND	MATRIX VALUE	0	0
TOTAL POPULATION SERVED	0 PERSONS		
NUMBER OF HOUSES	0		
NUMBER OF PERSONS	0		
NUMBER OF CONNECTIONS	0		
NUMBER OF IRRIGATED ACRES	0		
TOTAL TARGETS SCORE:			3

GROUND WATER ROUTE SCORE (Sgw) = 3.27

HRS SURFACE WATER ROUTE SCORE

CATEGORY/FACTOR	RAW DATA	ASN. VALUE	SCORE
1. OBSERVED RELEASE	NO	0	0
2. ROUTE CHARACTERISTICS			
SITE LOCATED IN SURFACE WATER	NO		
SITE WITHIN CLOSED BASIN	NO		
FACILITY SLOPE	5.1 %		
INTERVENING SLOPE	0.0 %	0	0
24-HOUR RAINFALL	3.3 INCHES	3	3
DISTANCE TO DOWN-SLOPE WATER	3500 FEET	2	4
PHYSICAL STATE	3		3
TOTAL ROUTE CHARACTERISTICS SCORE:			10
3. CONTAINMENT	3		3
4. WASTE CHARACTERISTICS			
TOXICITY/PERSISTENCE:ASSIGNED VALUE,18			18
WASTE QUANTITY CUBIC YDS	2501		
DRUMS	0		
GALLONS	0		
TONS	0		
TOTAL	2501 CU. YDS	8	8
TOTAL WASTE CHARACTERISTICS SCORE:			26
5. TARGETS			
SURFACE WATER USE		2	6
DISTANCE TO SENSITIVE ENVIRONMENTS		0	0
COASTAL WETLANDS	NONE		
FRESH-WATER WETLANDS	NONE		
CRITICAL HABITAT	NONE		
DISTANCE TO STATIC WATER	3000 FEET		
DISTANCE TO WATER SUPPLY INTAKE	> 1 MILE		
AND	MATRIX VALUE	0	0
TOTAL POPULATION SERVED	0		
NUMBER OF HOUSES	0		
NUMBER OF PERSONS	0		
NUMBER OF CONNECTIONS	0		
NUMBER OF IRRIGATED ACRES	0		
TOTAL TARGETS SCORE:			6

SURFACE WATER ROUTE SCORE (Ssw) = 7.27

HRS AIR ROUTE SCORE

CATEGORY/FACTOR	RAW DATA	ASN. VALUE	SCORE
1. OBSERVED RELEASE	NO	0	0

2. WASTE CHARACTERISTICS

REACTIVITY: MATRIX VALUE

INCOMPATIBILITY

TOXICITY

WASTE QUANTITY CUBIC YARDS
DRUMS
GALLONS
TONS

TOTAL

TOTAL WASTE CHARACTERISTICS SCORE: N/A

3. TARGETS

POPULATION WITHIN 4-MILE RADIUS
0 to 0.25 mile
0 to 0.50 mile
0 to 1.0 mile
0 to 4.0 miles

DISTANCE TO SENSITIVE ENVIRONMENTS
COASTAL WETLANDS
FRESH-WATER WETLANDS
CRITICAL HABITAT

DISTANCE TO LAND USES
COMMERCIAL/INDUSTRIAL
PARK/FOREST/RESIDENTIAL
AGRICULTURAL LAND
PRIME FARMLAND
HISTORIC SITE WITHIN VIEW?

TOTAL TARGETS SCORE: N/A

AIR ROUTE SCORE (Sa) = 0.00

HAZARD RANKING SYSTEM SCORING CALCULATIONS
FOR
SITE: PRISMO UNIVERSAL CORPORATION
AS OF 12/19/89

GROUND WATER ROUTE SCORE

ROUTE CHARACTERISTICS		8
CONTAINMENT	X	3
WASTE CHARACTERISTICS	X	26
TARGETS	X	3

= 1872 /57,330 X 100 = 3.27 = S_{gw}

SURFACE WATER ROUTE SCORE

ROUTE CHARACTERISTICS		10
CONTAINMENT	X	3
WASTE CHARACTERISTICS	X	26
TARGETS	X	6

= 4680 /64,350 X 100 = 7.27 = S_{sw}

AIR ROUTE SCORE

OBSERVED RELEASE 0 /35,100 X 100 = 0.00 = S_{air}

SUMMARY OF MIGRATION SCORE CALCULATIONS

	S	S^2
GROUND WATER ROUTE SCORE (S_{gw})	3.27	10.69
SURFACE WATER ROUTE SCORE (S_{sw})	7.27	52.85
AIR ROUTE SCORE (S_{air})	0.00	0.00
$S^2_{gw} + S^2_{sw} + S^2_{air}$		63.54
$\sqrt{(S^2_{gw} + S^2_{sw} + S^2_{air})}$		7.97
$S_M = \sqrt{(S^2_{gw} + S^2_{sw} + S^2_{air})}/1.73$		4.61

"Rite in the Rain"

ALL-WEATHER

LEVEL

Notebook No. 311

F4-1761

Prismo Universal Corp
TDD F48960-92
East Point / Fulton / GA
Proj. Mgr. Sherman Ballard Jr.
Run: on 10-19-89

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 2[illegible], 19[illegible]

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

1. Record on front cover of the Logbook: TDD No., Site Name, Site Location, Project Manager.
2. All entries are made using ink. Draw a single line through errors. Initial and date corrections.
3. Statement of Work Plan, Study Plan, and Safety Plan discussion and distribution to field team with team members' signatures.
4. Record weather conditions and general site information.
5. Sign and date each page. Project Manager is to review and sign off on each logbook daily.
6. Document all calibration and pre-operational checks of equipment. Provide serial numbers of equipment used onsite.
7. Provide reference to Sampling Field Sheets for detailed sampling information.
8. Describe sampling locations <u>in detail</u> and document all changes from project planning documents.
9. Provide a site sketch with sample locations and photo locations.
10. Maintain photo log by completing the stamped information at the end of the logbook.
11. If no site representative is on hand to accept the receipt for samples, an entry to that effect must be placed in the logbook.
12. Record I.D. numbers of COC and receipt for sample forms used. Also record numbers of destroyed documents.
13. Complete SMO information in the space provided.

10-19-88 The undersigned have read the work plan for this phase of the site assessment. No study plan or safety plan are generated for off site recons.

Solomon Pollard Jr

Solomon Pollard Jr.

Prince L. Goins

Prince L. Goins

All entries will be made by me Solomon Pollard and all photos will be described in photo log beginning on page 41.

SP
10-19-88

000001

000002

000000

1040 Arrived at Prismo Universal Corp property. The weather was cloudy (42°).

I turned right off of North Martin Street onto Ware Street and parked in a lot just north of the property.

The property looked fairly deserted (and needed paint).

The property was well fenced and included barbed wire at the top.

1050 I took Photo I from my parking area:

SP 10-19-88

000003

panoramic shots from NW to NE (pics 1-4).

Bldg I was on the corner of Ware and North Martin Streets (Fig I). It has the address marker (2675). There is a fire hydrant at this corner while a sample well ~~was~~ is located on the west side of this Bldg. 10-19-94 SPD

This Bldg looked deserted from this angle or view.

Bldg II (located west of Bldg I) had a truck parked in front of it (flat foot truck). It appeared more office/warehouse worthy.

10-19-94
SPD

there is a fire hydrant and sample well on the south side of this Bldg. I did not notice any worker's cars.

1058 I proceeded west on Ware Street and took Photo II which shows the rear of Bldg II. The gate at this point was also locked (as ~~was~~ the gate between Bldgs I + II). The space in this alley ~~was~~ contained debries (mostly wood and stone). The fire escape of Bldg III has fallen as shown in this picture.

10-19-94
SPD

10-19-94
SPD

Bldg III is located
west of Bldg II and
is a 2 story bldg.
The windows are boarded
closed as shown in
Photo ~~III~~ III (south side
facing North shot of
Bldg III).
There are TV cameras
located at the top
NE Corner of Bldg III,
W side of Bldg II and
NE corner of the bldg
North of Bldg III.

Railroad tracks ran
between Bldgs II + III.
But are currently unused
(Photo II).

1108 I proceeded West on
Wone Street and left
the vehicle at the
edge of the perpendicular

10-19-99
SPD

set of Railroad (RR)
tracks which ran
accross the West side
of the property.

Photo IV displays
the tracks with
the adjacent Marta
Tracks.

From this angle
I could more clearly
discern that the
TV cameras were actually
large flood lights.
Two are located on
the west side of Bldg III.

1115 I proceeded (on foot)
North beside the RR
tracks where I
noticed a connecting
bldg between Bldg III
and Bldg IV located

10-19-99
SPD

north of Bldg III).
Photo ~~IA~~ which shows
this connecting bldg.
Noteworth is the
inactive smoke stack
on top of this structure.

Bldg IV is also a
two story - Boarded
windows structure.

1130 I ~~turned~~ turned
10-19-89 SDD
right onto Access Rd
I (Fig I). I walked
about 25 feet and
took Photo VI (pic 1-3)
panoramic from SE to
SW. This side of the
property was also
fenced and the property's
workers cars were
parked here and
Photo VI pic 3 depicts
one of the 2 vehicles.
10-19-89 SDD

From here I could
see that Bldg I was
in use and had a
a carport with 3 to 5
drums under it. There
was also a astro van
parked there. There is
a sheet of plastic
covering a mound of
dirt in the center
of this open area
beside Bldg II.
Also there are about
50 drums stacked
beside Bldg II (north
side).

1146 I walked up to the
gate and took (15 ft west)
Photo VII (pic 1-5)
from east to west.
Pic I shows a
pit just inside of
the property's fence
10-19-89 SDD

I could also see debries mostly broken concrete blocks.

There is another set of what looked liked drums that were covered with blue plastic. I am not sure that these are drums. They are located near bldg I (north west side) in the driveway area.

I could also see that Bldg IV has a long loading dock on its east side which did not ~~looked~~ 10-19-89 S.P.D. used.

The water path will flow east from the property then South east to Norman Berry Road.

All property on the east of M. Street is commercial. Residents are located on the west of M. Street. No stressed vegetation.

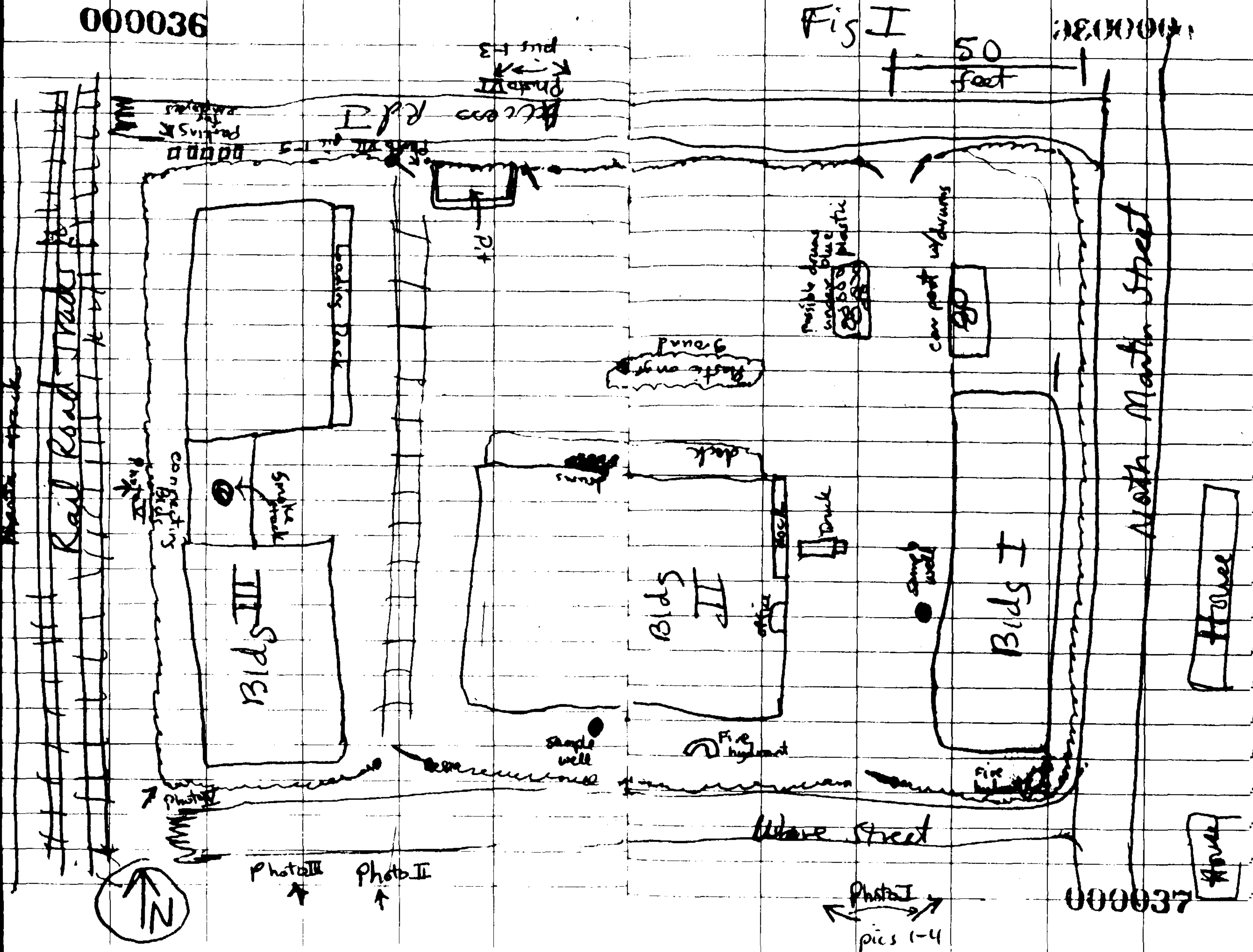
1205 Left the property area

Solomon Pollard Jr

10-19-89

Note that the property covers less than 1 acre (1 Block).

000036



000037

000040

Airbill No.

Airbill No.

Lab

Lab

Media Soil Water

Soil Water

Case No.

Low Concentration yes/no

Organics

No.

Date 10-19-89 By Whom S Pollard

Time 1050 # keyed to map: Photo I

Location ~~North~~ South of Property

pics 1-4

Picture of Panoramic Pic of South side of Property facing North

Date 10-19-89 By Whom S Pollard

Time 1058 # keyed to map: Photo II

Location South of Property

Picture of Alley Behind Bldg II

Date 10-19-89 By Whom S Pollard

Time 1059 # keyed to map: Photo III

Location South of Property

Picture of Bldg III

000041

Date 10-19-89 By Whom S. Pollard

Time 1108 # keyed to map Photo IV

Location South West of Property

Picture of ~~Connecting bldg between Bldgs~~
~~III + IV~~ View of West side of Property

Date 10-19-89 By Whom S. Pollard

Time 1115 # keyed to map Photo V

Location West of Property

Picture of Connecting bldg between Bldgs
III + IV

Date 10-19-89 By Whom S. Pollard

Time 1130 # keyed to map Photo VI

Location North side of Property

Pics 1-3

Picture of Panorama view of Property
facing South

Date 10-19-89 By Whom S. Pollard

Time 1146 # keyed to map Photo VII

Location North of Property

Pic 1-5

Picture of North side of Property
through fence (closer)

Date By Whom

Time # keyed to map:

Location

Picture of

Date By Whom

Time # keyed to map:

Location

Picture of

000048

Date ____________ By Whom ____________

Time ________ # keyed to map ________

Location ______________________________

____

Picture of ______________________________

____

Date ____________ By Whom ____________

Time ________ # keyed to map ________

Location ______________________________

____

Picture of ______________________________

____

Date ____________ By Whom ____________

Time ________ # keyed to map ________

Location ______________________________

____

Picture of ______________________________

____

[illegible]

Water Samples

PW - Private Well
PB - Public (Municipal) Well
MW - Monitoring (Permanent) Well
TW - Temporary (Well Point) Well
IW - Industrial Well
SW - Surface Water
SP - Spring Water
LW - Leachate Water

Soil [illegible]

SS - [illegible]
SB - [illegible]
SZ - [illegible]
SD - Sediment
CS - Composite [illegible]
LS - Leachate [illegible]

OTHER CODES:

AR - Air
SL - Sludge
WA - Waste
DR - Drum

QC - Quality Control
AQ - Aquatic (Biological)
TB - Trip Blank

For all samples that are to be analyzed by the in house FIT IV [illegible] following deviation from the standard codes are to be used. The [illegible] (denoting FIT Lab Analysis) is to be inserted in front of the sample number.

Example: Standard Auto Sampling Investigation - Temporary Well Groundwater Sample - Number 08

Appropriate Code: [illegible]

Reference 3

PRELIMINARY ASSESSMENT COVER SHEET
PRISMO UNIVERSAL CORP.
GAD088935960

I. HISTORY OF SITE

The Prismo Universal Corporation (currently known as Redland Prismo Corporation), located at 2675 Martin Street in East Point, Georgia 30344, relocated its operations to 1204 Airport Road in Ball Ground, Georgia on December 21, 1984. The facility, prior to its closing, had been in operation since 1951. The subject East Point facility is owned by Redland Prismo Corporation of Parsippany, New Jersey. The facility was used to manufacture traffic markings and industrial paints and top coats. The Part A Application for this facility was withdrawn and, prior to closure, the facility was classified as a generator of hazardous waste.

II. NATURE OF HAZARDOUS MATERIALS

Prior to closing the facility generated spent solvents (benzene, toluene), caustic liquids and paint wastes (sludge). Exact waste quantities are unknown, however two 2,500 gallon waste water tanks and two 8,000 gallon caustic waste water tanks were emptied by Barton Environmental and cleaned by Underwood Industries prior to the facility's relocation. Spent solvents were contained within 55 gallon drums in a storage area prior to disposal.

III. DESCRIPTION OF HAZARDOUS CONDITIONS, INCIDENTS, PERMIT VIOLATIONS

According to Mr. David Miller, Director of Operations for Prismo Universal Corporation (currently Redland Prismo Corporation), there were no spills to the best of his recollection. There have been numerous inspections of the facility by the Georgia EPD. Wastes generated at the site have been released via overflowing tanks in a diked area, leaking of a diked area, dumping of drum contents in a storage area resulting in wastes leaving the site, and spills of alkyd resins at an off-loading ramp.

IV. ROUTES FOR CONTAMINATION

On-site spillage of wastes resulted in wastes leaving the site via surface run-off and infiltration into soil.

V. POSSIBLE AFFECTED POPULATION AND RESOURCES

Residences in the area are served by a municipal water supply system; no wells are thought to be in the area. The population within a three mile radius of the site exceeds 250,000 due to its metropolitan area location.

VI. RECOMMENDATIONS AND JUSTIFICATIONS

This site is assessed a "Low" priority for a Site Inspection because 1) there have been numerous waste releases at the facility and 2) there has not been a final inspection of the site after all manufacturing activities were relocated to Ball Ground, Georgia.

VII. REFERENCE TO SUPPORTING DATA SOURCES

1. EPA 3510-1, 3510-3 (6/80) Form, 11/13/80.
2. Application for Hazardous Waste Facility Permit, 2/12/81.
3. Letter, 10/16/81, RE: Hazardous Waste Permit, 10/16/81.
4. Generator Hazardous Waste Reports: 1981 & 1982.
5. Memorandum, 5/12/82, RE: Storage Permit.
6. Letter, 8/12/81, RE: Formal Request for Part B Application.
7. Letter, 12/3/82, RE: Withdrawal of Part A Application for Prismo Universal Corporation.
8. Letter, 1/24/83, RE: Acknowledgement of withdrawal from Georgia EPD.
9. Trip Reports: 1/5/83, 2/14/83, 7/15/83, 8/10/83 & 2/20/85.
10. Letter, 6/30/83, RE: Notice of Violation.
11. Alabama Hazardous Wastes Manifests, 1/24/83 and 6/29/83.
12. Letter, 6/8/83, RE: Notice of Violation from Georgia EPD.
13. Georgia Annual Hazardous Waste Report, 1983.
14. Waste Management Data Sheet, 2/13/84.
15. Telephone Conversation Record, 1/10/86.

GAK/mcw011(2)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D088935960

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Prismo Universal Corp.	2675 Martin Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
East Point	GA	30344	Fulton	121	06

09 COORDINATES LATITUDE	LONGITUDE	
33 37' 30.0"	082 26' 37.0"	Currently: Redland Prismo Corp.

10 DIRECTIONS TO SITE (Starting from nearest public road)

The facility is located on the west side of Martin Street between East Forrest Ave. and East Ware Street.

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)
Prismo Universal Corporation	300 Lanidex Plaza

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Parsippany	NJ	07054	(201) 884-0300

07 OPERATOR (if known and different from owner)	08 STREET (Business, mailing, residential)
Prismo Universal Corp.	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
2675 Martin Street	GA	30344	(404) 479-6515

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: ____________ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: ____________ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☒ A. RCRA 3001 DATE RECEIVED: 11 / 13 / 80 (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __ / __ / __ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☒ YES DATE 1 / 24 / 83; 2 / 14 / 83; 6 / 15 / 83 (MONTH DAY YEAR)

☐ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR

☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: ____________ (Specify)

CONTRACTOR NAME(S): ____________

02 SITE STATUS (Check one)

☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

1951 (BEGINNING YEAR) | 1984 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Spent solvents (toluene, benzene), caustic paint sludge, sodium hydroxide, paint wastes, resins (alkyd).

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Possible spills from drum storage area, overflow of tanks in diked area.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☒ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
David Miller	Redland Prismo Corp.	(404) 479-6515

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Gilda A. Knowles	DNR EPD	REMEDIAL ACTION	(404) 656-7404	1 13 86 (MONTH DAY YEAR)

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D088935960

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER ______ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS ______

CUBIC YARDS ______

NO. OF DRUMS ______

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☒ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	unknown		paint waste (residue - tanks)
OLW	OILY WASTE			
SOL	SOLVENTS	unknown		solvents (benzene, toluene)
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SOL	toluene	108-88-3	M & M Chemical Co.		
	benzene	71-43-2	M & M Chemical Co.		
SLU	unknown (residue		SCA Services, Inc.		
	from tanks) paint wastes				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Prismo Universal Corp.; East Point, GA (GA EPD STATE FILES)

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

EPA

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D088935960

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 6-15-83) ☐ POTENTIAL ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Overflowing tanks of caustic waste, possibly entering small creek across from Norman Berry Drive.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☒ OBSERVED (DATE: 6-15-83) ☐ POTENTIAL ☒ ALLEGED
03 AREA POTENTIALLY AFFECTED: ______ (Acres) 04 NARRATIVE DESCRIPTION

Deliberate dumping of drum contents in drum storage area, spillage of alkyd resins (off-loading ramp).

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: GA
02 SITE NUMBER: D088935960

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, runoff, standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______
04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: 6-15-83) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION

Deliberate dumping of drums (contents) in drum storage area, fluids running into city sewer.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

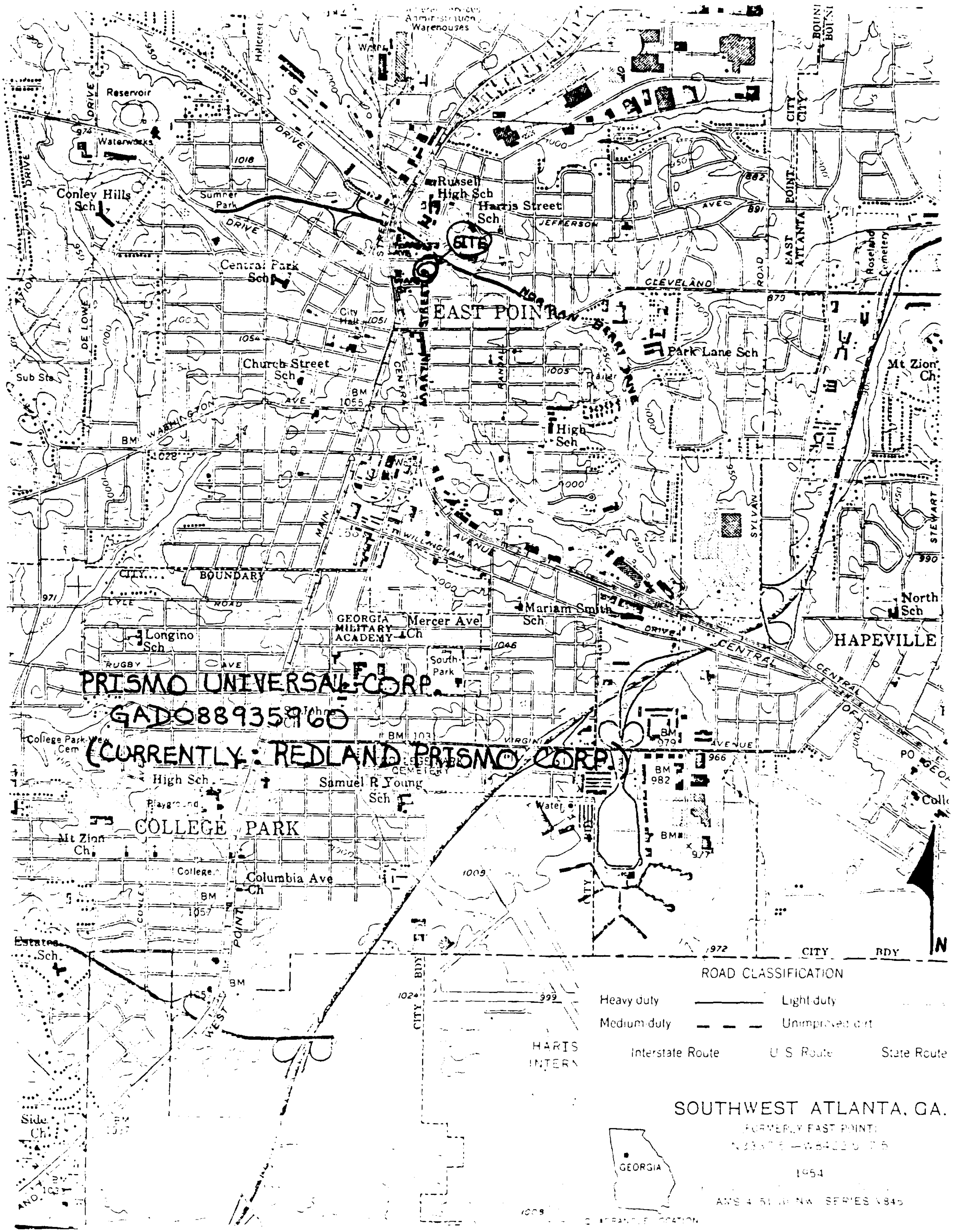
III. TOTAL POPULATION POTENTIALLY AFFECTED: 1 mile= greater than 250,000 site located in metropolitan area of city (heavily populated).

IV. COMMENTS

On June 24, 1983 - Contaminated soil adjacent to drum storage area was removed and disposed of in a permitted hazardous waste disposal site. Diked area around over-flowing tanks pumped out of excess liquid and disposed of. Diked area repaired to prevent leaks. Repairs reported completed 8-10-83 for first excavation. Still awaiting final report of closing.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

GA EPD STATE FILES
PRISMO UNIVERSAL CORP.; EAST POINT, GA



SITE
PRISMO UNIVERSAL CORP.
GAD088935960
(CURRENTLY: REDLAND PRISMO CORP.)
Administration Warehouses
Reservoir
Waterworks
Conley Hills Sch
Sumner Park
Russell High Sch
Harris Street Sch
JEFFERSON AVE
Central Park Sch
CLEVELAND
City Hall
EAST POINT
NORMAN BERRY DRIVE
Park Lane Sch
Church Street Sch
Sub Sta
WASHINGTON AVE
High Sch
Mt Zion Ch
MAIN STREET
CENTRAL
WILLINGHAM AVENUE
SYLVAN
STEWART
CITY BOUNDARY
LYLE ROAD
Mariam Smith Sch
North Sch
HAPEVILLE
GEORGIA MILITARY ACADEMY
Mercer Ave Ch
Longino Sch
RUGBY AVE
South Park
CENTRAL AVENUE
College Park-View Cem
High Sch
Samuel R Young Sch
COLLEGE PARK
Mt Zion Ch
Columbia Ave Ch
Estates Sch
WEST POINT
CITY BDY
ROAD CLASSIFICATION
Heavy duty
Light duty
Medium duty
Unimproved dirt
Interstate Route
U S Route
State Route
HARTS INTERN
SOUTHWEST ATLANTA, GA.
FORMERLY EAST POINT
GEORGIA
1954
N

Please print or type in the unshaded areas only (fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL — EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

file copy 0224

GENERAL INSTRUCTIONS

If a preprinted label has been provided, a[ffix] it in the designated space. Review the info[rm]ation carefully; if any of it is incorrect, c[ross] through it and enter the correct data in [the] appropriate fill—in area below. Also, if any [of] the preprinted data is absent *(the area to [the] left of the label space lists the informa[tion] that should appear)*, please provide it in [the] proper fill—in area(s) below. If the labe[l is] complete and correct, you need not comp[lete Items I, III,] V, and VI (except VI-B w[hich must be completed]). Complete [all] items if no label has been provided. Refer [to] the instructions for detailed item desc[rip]tions and for the legal authorizations un[der] which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X			F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP PRISMO UNIVERSAL CORPORATION

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 SUDDUTH, CHARLES GEN. MGR.	404 767 0564

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 P. O. BOX 90868

Harris Freedman
[illegible]

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 EAST POINT	GA	30364

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 2675 MARTIN STREET

B. COUNTY NAME

FULTON

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 EAST POINT	GA	30344	

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST		B. SECOND	
C 7 2 8 5 1	*(specify)* PAINT, VARNISH, LACQUERS	C 7	*(specify)*
C. THIRD		**D. FOURTH**	
C 7	*(specify)*	C 7	*(specify)*

VIII. OPERATOR INFORMATION

A. NAME

C 8 P R I S M O U N I V E R S A L C O R P O R A T I O N

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box: if "Other", specify.)*

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

M *(specify)*

D. PHONE *(area code & no.)*
C A 2 01 8 84 0 3 00

E. STREET OR P.O. BOX

3 0 0 L A N I D E X P L A Z A

F. CITY OR TOWN	G. STATE	H. ZIP CODE
C 8 P A R S I P P A N Y	N J	07054

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*		D. PSD *(Air Emissions from Proposed Sources)*	
C T I 9 N	NA	C T I 9 P	NA
B. UIC *(Underground Injection of Fluids)*		**E. OTHER** *(specify)*	
C T I 9 U	NA	C T I 9	NA *(specify)*
C. RCRA *(Hazardous Wastes)*		**E. OTHER** *(specify)*	
C T I 9 R	NA	C T I 9	NA *(specify)*

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

Manufacture of traffic markings, including paints and plastics, and industrial paints, including surface primers and top coats.

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
	Charles H. Sudduth, Gen. Mgr.	11/13/80

COMMENTS FOR OFFICIAL USE ONLY

C

Please print or type in the unshaded areas only (fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA EPA

ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATIC

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

F GAD 0 9 8 9 3 5 9 6 0

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facilit EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

[ ] 2. NEW FACILITY *(Complete item below.*

C 8 — YR. 48 MO. 06 DAY 15 — FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR. MO. DAY — FOR NEW FACILI PROVIDE THE DA *(yr., mo., & day)* OP TION BEGAN OR I EXPECTED TO BE

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided f entering codes. If more lines are needed, enter the code*(s)* in the space provided. If a process will be used that is not included in the list of codes below, t describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and th other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. 1. AMOUNT (specify)	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. 1. AMOUNT	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 1	25,000	G		7				
2	S 0 2	15,500	G		8				
3					9				
4					10				

Continued from the front.

III. PROCESSES (continued)

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER — Enter the four—digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four—digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non—listed waste*(s)* that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non—listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed hazardous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non—listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
X-1	K 0 5 4	900	P	T 0 3	D 8 0			
X-2	D 0 0 2	400	P	T 0 3	D 8 0			
X-3	D 0 0 1	100	P	T 0 3	D 8 0			
X-4	D 0 0 2							included with above

CONTINUE ON PAGE 3

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	T/A	C	FOR OFFICIAL USE ONLY	T/A	C	
W	~	1	W DUP		2	DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	F001	5525	P	S01	S02			
2	K078	36,000	P	S01	S02			
3	K079	42,500	P	S01	S02			
4	K081	21,600	P	S01	S02			
5	K082	50,400	P	S01	S02			
6	U002	3305	P	S01	S02			
7	U056	975	P	S01	S02			
8	U112	800	P	S01	S02			
9	U154	650	P	S01	S02			
10	U159	3000	P	S01	S02			
11	U161	100	P	S01	S02			
12	U220	18,250	P	S01	S02			
13	U226	100	P	S01	S02			
14	U239	2534	P	S01	S02			
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

EPA Form 3510-3 (6-80)

CONTINUE ON REVEF

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. *(enter from page 1)*	T/A	C
F	-	6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
82 26 37	33 37 30

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E PRISMO UNIVERSAL CORPORATION	201-884-0300

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F 300 LANIDEX PLAZA	G PARSIPPANY	NJ	07054

IX. OWNER CERTIFICATION

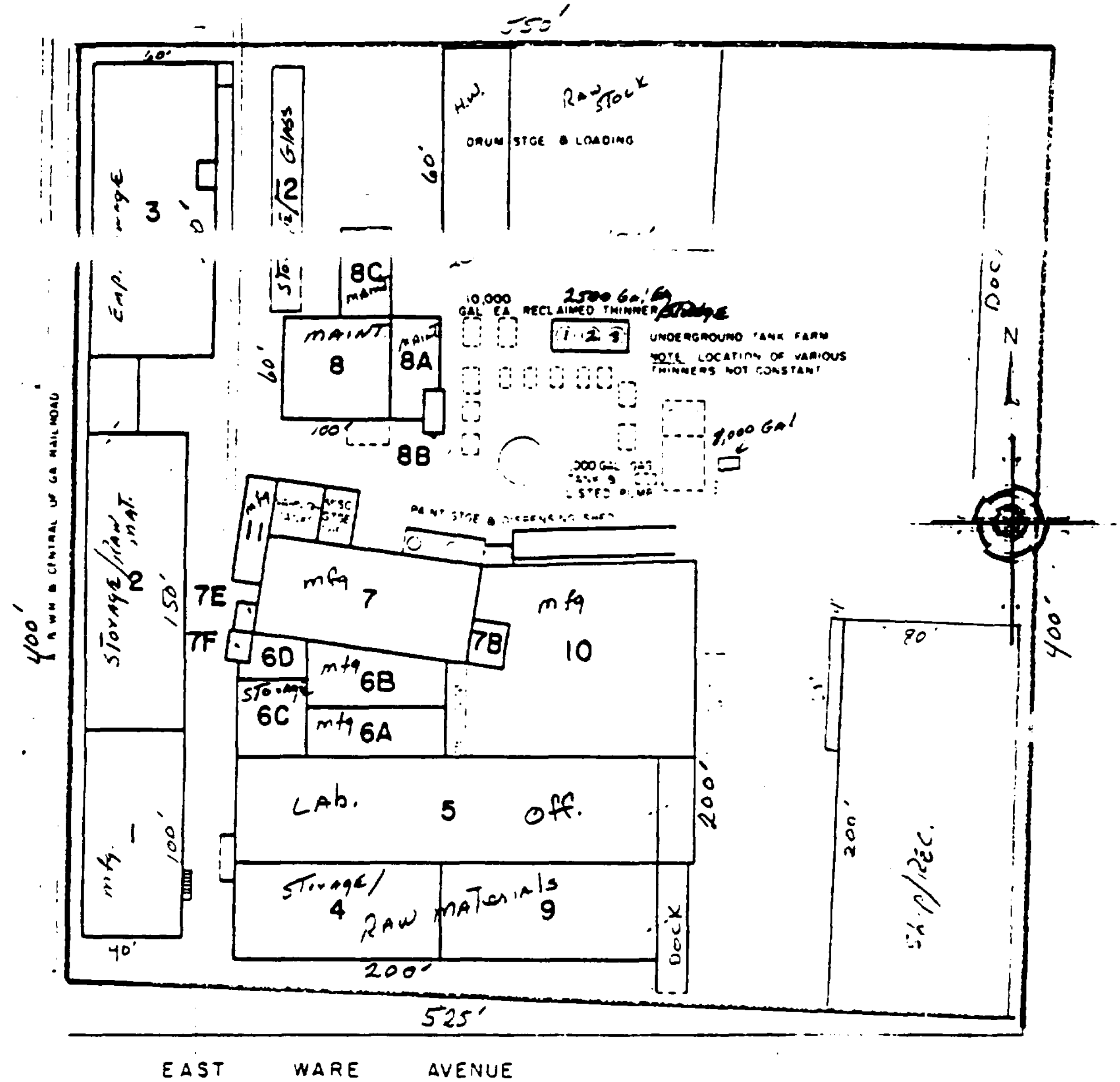
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Robert S. Whittier	Robert S Whittier	11/13/80

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED



PLAT PLAN OF

HAZARDOUS WASTE STORAGE

WILLIAM ARMSTRONG SMITH CO.

2675 MARTIN STREET

EAST POINT, GEORGIA

SCALE

0 50 100

APPRAISED BY

CB

6-30-75

Reference 4

PRELIMINARY ASSESSMENT
TELEPHONE CONVERSATION RECORD

Site Name: Prismo Universal Corp. (CURRENTLY Redland Prismo Corp.) I.D.# GAD

Location Address: New Address – 1204 Airport Road; Ball Ground, Ga. 30107
Old Address – 2675 Martin Street; East Point, Ga. 30344

Phone: (404) 479 - 6515.

Contact: Mr. David Miller Title: Director of Operation

Address: 1204 Airport Road; Ball Ground, Ga. 30107

Phone: (404) 479 - 6515.

Authority: Section 3012 of CERCLA, Comprehensive Environmental Response, Compensation and Liability Act.

Facility has notified EPA via – RCRA 3001 site is in HWDMS
CERCLA 103c site is in NOTIS

Need Information concerning waste generation and disposal prior to Nov. 19, 1980.

How long has facility been in operation? 1951

What kind of wastes were generated and how much?

1) caustic liquid (potassium hydroxide. 2) caustic solution plus spent solvents (cleaning of tanks 3) paint wastes (turn over page-back)

Was it disposed on site and where?

Wastes were never disposed of onsite.

Was it transported offsite and where?

Was it treated and how?

Wastes were never treated on site

Have there been any past spills? Describe.

No spills to the best of his recollection. Drains on site were sealed, prior to the company's operation (over on back)

Date of call: 1-10-86 Time: 1:00 PM Spoke with Mr. Miller said he would get back to me Monday or Tuesday (13, 14) with answers to amount generated and where wastes were transported off-site

1-13-86 ——— 3:15 PM – Left Message
1-13-86 3:45 Mr. Miller said that he would get back to me this week.

However, prior to moving to Ball Ground, Ga., 2,000 lbs of dirt was removed from around diked area.

Reference 5
file

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET S.W.
ATLANTA, GEORGIA 30334

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

TRIP REPORT

July 20, 1983

SITE NAME & LOCATION:	Prismo Universal, 2675 Martin Street P.O.Box 90868, East Point, Georgia 30364 Phone: 767-0564
TRIP BY:	Ed Cook, Environmental Specialist EC
ACCOMPANIED BY:	None
DATE OF TRIP:	July 15, 1983
OFFICIALS CONTACTED:	Mr. Edward Pesavento, Production Manager
REFERENCE:	Report of hazardous waste dumping received via Emergency Response telephone on 7-15-83.

COMMENTS:

1. This company was visited as a result of a report received on Emergency Response telephone. A (b) (6) reported that the company was dumping flammable resins on the south side of its property.

2. Upon my arrival, I inspected the periphery of the company to determine if there was any obvious dumping. Other than several apparently damaged drums stacked along the fence (Photo No. 1) on Forrest Street, there was no other evidence of waste material.

3. I met with Mr. Pesavento, explained the purpose of my visit, and requested to inspect the plant. Mr. Pesavento stated he had heard some rumor earlier about this matter and then directed me to their tanker truck off-loading area. This area on the south-west side of the facility is where tanker trucks off-load alkyd resins used in Prismo's processes. The plant chemist explained these resins are formed by reacting ethylene glycol or glycerol with phthalic anhydride then solvents (up to 40%) are added. These materials are used in exterior paints.

4. A tanker, placarded with the number 1866 in a red background (Resin solution), was off-loading (Photo #2). Transfer hoses connected at the truck were observed to be dripping material on the ground (Photo #3). Previous spillage was very apparent. The truck driver had placed a piece of cardboard over a puddle to protect his hose (Photo #4). Soil in the immediate vicinity was saturated with this resinous material which had solidified to form a sponge-like consistency. Pipe connections at the

building were not leaking at the time (Photo #5) but there was evidence to show where previous leakage had flowed around the corner of the building (Photo #6).

5. Mr. Pesavento explained some of the drivers had complained the off-loading area was getting soggy and the drivers were concerned about getting stuck. Prismo had plans to correct this situation by covering the area with crushed stone.

6. I advised Mr. Pesavento that this waste resin probably contained some amount of residual solvents and thus the waste resin and contaminated soil must be excavated and managed as a hazardous waste.

CONCLUSIONS:

1. Over an undetermined time period, alkyd resins (some containing up to 40% solvent) have been spilled on the ground while off-loading the material at Prismo.

2. Waste liquid resin is a hazardous waste (HW # D001). However, upon "setting up", the majority of the solvent present volatilizes.

3. Prismo Universal agreed to take steps to remove the waste resin and contaminated soil and manage it as hazardous waste.

RECOMMENDATIONS:

1. Send Prismo a compliance status letter giving them a deadline of no more than 15 days to clean up this area.

2. Recommend in compliance status letter that Prismo alleviate this problem by constructing a berm concrete off-loading pad where spills that occur during loading can easily and immediately be cleaned up.

PHOTOS: 6

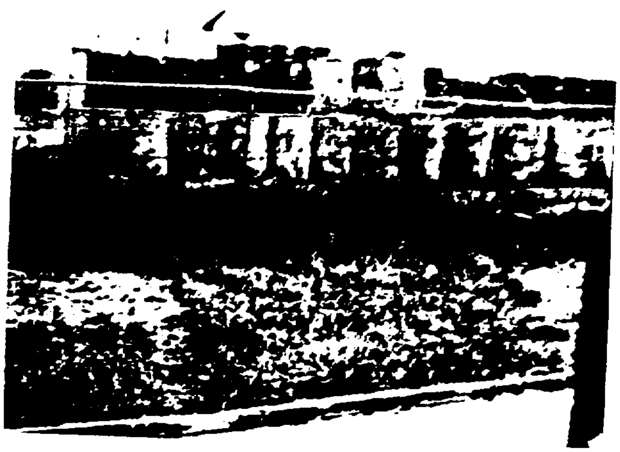
ATTACHMENTS: None

REVIEWED BY:

FILE: Prismo Universal, East Point (R)

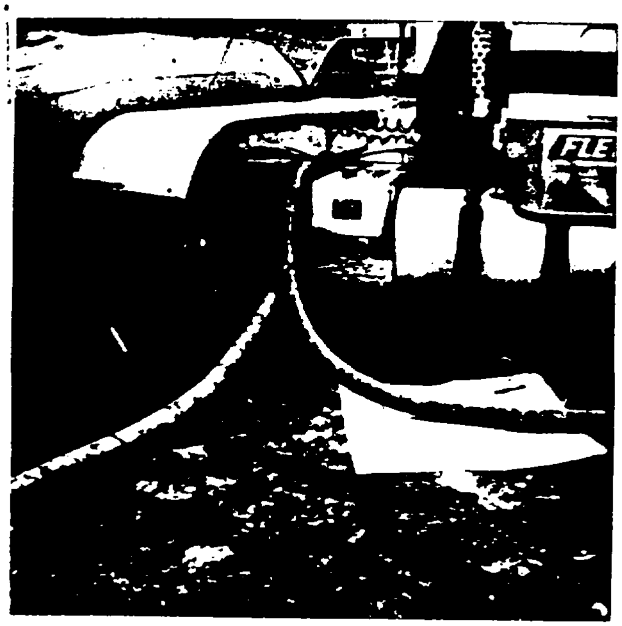
EC:mg:2421B

Prismo Universal



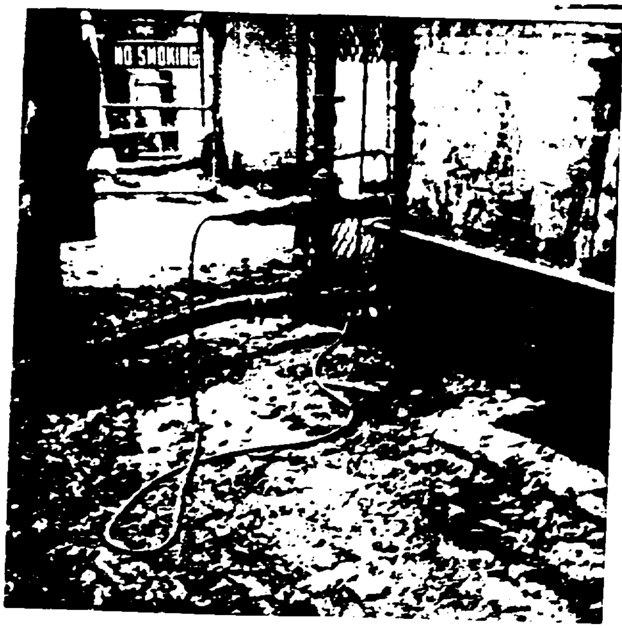
1

2



3

4



5

6

1982 FORMS

Reference 6

ENVIRONMENTAL PROTECTION AGENCY
GENERATOR ANNUAL HAZARDOUS WASTE REPORT

This report is for the calendar year ending December 31, 1982

Prismo Universal Corporation
P.O. Box 90868
East Point, Ga. 30364

GENERAL INSTRUCTIONS: If you received a preprinted label attached to the mailing envelope in which this form was enclosed, affix it in the space provided. If any of the information on the label is incorrect, draw a line through it and provide the correct information in the appropriate section below. If the information is correct and complete, leave sections I, II, and III below blank. If you did not receive a preprinted label, complete all sections. REFER TO THE SPECIFIC INSTRUCTIONS CONTAINED IN THIS BOOKLET BEFORE COMPLETING THIS FORM. The information requested in this report is required by law (Section 3002 of the Resource Conservation Recovery Act).

Please print/type with elite type (12 characters per inch)

I. GENERATOR'S EPA I.D. NUMBER

T/A C

G A D 0 8 8 9 3 5 9 6 0

II. NAME OF INSTALLATION

PRISMO UNIVERSAL CORPORATION

III. INSTALLATION MAILING ADDRESS

POST OFFICE BOX 90868

Street or P.O. Box

EAST POINT | GA | 30364

City or Town | State | Zip Code

IV. LOCATION OF INSTALLATION (if different than section III above)

2675 MARTIN STREET

Street or Route number

EAST POINT | GA | 30364

City or Town | State | Zip Code

V. INSTALLATION CONTACT

EDWARD J PESAVENTO

Name (last and first)

404-767-0564

Phone No. (area code & no.)

SIC CODE 2 8 5 1

VI. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Print/Type Name	Title	Signature of Authorized Representative	Date Signed
Edward J. Pesavento	Production Manager	E. J. Pesavento	3/15/83

Tear out here

1982 FORMS

Do not make entries in shaded area

ENVIRONMENTAL PROTECTION AGENCY

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1982

Date rec'd: ______ Rec'd by: ______

VII. GENERATOR'S EPA I.D. NO.

T/A C

G A D 0 8 8 9 3 5 9 6 0

1 2 13 14 15

VIII. FACILITY NAME (specify facility to which all wastes on this page were shipped)

SOUTHEASTERN WASTE TREATMENT, INC.

IX. FACILITY'S EPA I.D. NO.

6 A D 0 0 0 2 2 2 0 8 3

16 28

X. FACILITY ADDRESS

P.O. Box 1697
1025 NEW SOUTH HARRIS ST.
DALTON, GA. 30720

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification numbers of all transporters whose services were used during 1982 This section to be completed only once. Do not repeat on supplemental sheets.)

SOUTHEASTERN WASTE TREATMENT, INC.
GAD000222083

XII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. DOT Hazard code	C. EPA Hazardous Waste No. (see instructions)		D. Amount of Waste	E. Unit of Measure
0 0 1	1	FLAMMABLE LIQUID/BENZENE /TOLUENE	0 8	F 0 0 3	F 0 0 5	1 0 6 0 8 2 0	P
0 0 2	2	WASTE CORROSIVE LIQUID NOS SODIUM HYDROXIDE	0 2	D 0 0 2		1 7 2 9 6 0	P
0 0 3	3	WASTE FLAMMABLE LIQUID NOS (BENZENE)	0 8	D 0 0 1		3 0 5 4 4 0	P
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						

XIII. COMMENTS (enter information by section number—see instructions)

Tear out here

Reference 7

SIC CODE ...

Georgia Environmental Protection Division
GEORGIA ANNUAL HAZARDOUS WASTE REPORT
Reporting Period January 1 thru December 31, 1983
FORM A
IDENTIFICATION

FEB 21 1984
ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

Please print/type with Elite type (12 characters per inch)

I. EPA I.D. NUMBER GAD088935960 (seq. no. 00820)

II. NAME OF INSTALLATION Prismo Universal Corp.
REDLAND PRISMO CORPORATION

III. INSTALLATION MAILING ADDRESS

P. O. BOX 90868
Street or P.O.Box
East Point GA 30364
City or Town State Zip Code

IV. LOCATION OF INSTALLATION (if different than Section III. above)

2675 Martin Street
Street or Route Number
East Point, GA 30344
City or Town State Zip Code
Fulton
County

V. INSTALLATION CONTACT

Pesavento, Ed
Name (last and first)
404-767-0564
Phone No. (Area code & number)

VI. PROCESS IN USE (Check as appropriate)

SQG	GEN	TRN	T01	T02	T03	T04	S01	S02	S03	S04	D80	D81	D83
	X												

X PRIVATE (Handle only self generated waste) __ COMMERCIAL (Handle waste generated from other sources)

VII. CERTIFICATION - I certify under penalty of Law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information. I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Ed Pesavento, Production Manager [signature] 2/15/84
Print/Type Name & Title Signature of Authorized Representative Date Signed

Greg Underwood
115/490-2795 Chattanooga

Name of Installation: REDLAND PRISMO CORP.

EPA I.D. Number: GAD 088935960

Form B

SELF-GENERATED HAZARDOUS WASTE AND ITS DISPOSITION

1. EPA HAZARDOUS WASTE NUMBER	D001		D002	~~ORM~~ D000		TOTAL
2. On Hand, On-site on January 1, 1983	16.15		23.32			39.47
3. Generated during 1983	224.42		414.49	74.71		638.11 ~~713.62~~
4. TOTAL AMOUNT FOR WHICH TO ACCOUNT	240.57		437.81	~~74.71~~		678.38 ~~753.09~~
5. Shipped to State of Tennessee (Stauffer)	31.59					31.59
6. Shipped to State of Alabama (CWM)			416.84	~~74.71~~		416.84 ~~491.55~~
7. Shipped to State of						
8. Shipped to State of						
9. Shipped to Georgia Facility for Use, Reuse, Recycle or Reclaim						
10. Shipped to Georgia Facility for Treatment, Storage, or Disposal (Tri-State)	195.54					195.54
11. Treated On-site None						
12. Treatment Code None						
13. Disposed of On-site None						
14. Disposal Code None						
15. On Hand, On-site on December 31, 1983	13.44		20.97			34.41
16. Storage Code	S01		S02			
17. Other (Explain)						
18. TOTAL AMOUNT OF DISPOSITION	240.57		437.81	~~74.71~~		678.38 ~~753.09~~

Is this waste hazardous and should it be counted?
No. Do not count.
GMW

6/11/84 Greg Underwood stated 74.71 tons of ORME was not
hazardous by definition but was disposed of as one. He will

Reference D

DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

WASTE MANAGEMENT DATA SHEET

RECEIVED

FEB 13 1984

MUNICIPAL SOLID WASTE

NAME AND LOCATION OF FACILITY

GAD 088935960

Redland Prismo Corporation
2675 Martin Street
East Point, Georgia 30344

PERSON TO CONTACT
(ENTER THE NAME, ADDRESS, TITLE AND BUSINESS TELEPHONE NUMBER OF THE PERSON TO CONTACT REGARDING INFORMATION SUBMITTED ON THIS FORM).

Edward J. Pesavento, Production Manager
Redland Prismo Corporation
2675 Martin Street
East Point, Georgia 30344 (404) 767-0564

479-6515

DATES OF WASTE HANDLING
(ENTER THE YEARS THAT YOU ESTIMATE WASTE TREATMENT, STORAGE OR DISPOSAL BEGAN AND ENDED AT THE SITE. IF YOU SELECTED A FACILITY OFF-SITE PLEASE NOTE AND EXPLAIN IN "COMMENTS" SECTION.

Prismo acquired facility April 3, 1978 - Disposal is ongoing.

GENERAL TYPE OF WASTE

1- ( ) ORGANICS
2- ( ) INORGANICS
3- (X) SOLVENTS
4- ( ) PESTICIDES
5- (X) HEAVY METALS
6- ( ) ACIDS
7- (X) BASES
8- ( ) PCB's
9- ( ) MIXED MUNICIPAL WASTE
10- ( ) UNKNOWN
11- ( ) OTHER (SPECIFY)

WASTE QUANTITY (ESTIMATED)

700 Tons Annually

HAS THERE EVER BEEN A SPILL OR DISCHARGE OF A HAZARDOUS SUBSTANCE FROM YOUR FACILITY? (BRIEFLY EXPLAIN THE NATURE OF THE RELEASE).

One of two waste caustic tanks overflowed and leaked out from under diked area. This occurred approximately February 1, 1983.

Dike repaired, overflow alarms installed and contaminated soil removed to a permitted waste disposal site.

COMMENTS

(IF THERE IS ANY COMMENTS THAT YOU BELIEVE WOULD CLARIFY THE PAST WASTE HANDLING PRACTICES OF YOUR FACILITY OR OF FACILITIES YOU SELECTED TO HANDLE YOUR WASTE, PLEASE ELABORATE IN THE SPACE PROVIDED).

Material presently being shipped to Chemical Waste Management, Tri State Steel Drum and Stauffer Chemical

SIGNATURE AND TITLE

Edward J. Pesavento		404-767-0564
NAME		TELEPHONE
2675 Martin Street		
STREET		
East Point	GA	30344
CITY	STATE	ZIP CODE
Edward J. Pesavento		2/10/84
SIGNATURE		DATE

Reference 9

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET S.W.
ATLANTA, GEORGIA 30334

Commissioner

J. LEONARD LEDBETTER
Division Director

March 19, 1985

TRIP REPORT

Site Name and Location:.............. Prismo Universal
East Point, Georgia

Trip By:............................ Gwen Glass GG

Accompanied By:.................. None

Date of Trip:........................ February 20, 1985

Officials Contacted:................. David Miller
Operations Manager

Reference: .... Follow-up Inspection

Comments:

Inspection of this facility was delayed due to relocation. Company is closing down operation in East Point and has moved to Canton, Georgia. (Old Cherokee Safety Facility). The office actually closed on December 21, 1984 and the last day of paint manufacturing was October 24, 1984. The following areas were inspected:

1) The two - 2500 gallon waste water tanks were emptied by Barton Environmental and cleaned by Underwood Industries. Tanks will eventually be moved to Canton.

2) The two - 8000 gallon caustic waste water tanks were emptied by Barton Environmental. Tanks will probably be sold to salvage company. This area is diked and previously contained lots of spillage. Will confirm that pit is concrete and if not, soil will need to be excavated and tested for proper disposition.

3) Building 2 was full of raw materials and finished goods. Plans to move this material to Canton within the next sixty (60) days.

4) Building 1 contained some finished goods and raw product. Will also be moved to Canton. A large heap of calcium carbonate was on ground outside Building 2, as a result of emptying the tank. This will have to be removed and properly disposed of.

5) Building 3 contained twenty-four (24) drums of pebbles. Previously Crack Filling Operation. Also about twelve (12) 55-gallon drums were filled with 1/2 pint cans of obsolete crack filling, about six (6) 5-gallon cans - all to be used at Canton.

6) Tank Farm (Six tanks) raw alkyd resins will be sold to Dyabond.

7) Building 8 was previously the maintenance department and about seven (7) 55-gallon drums of high detergent oil was still on site. Plans are to move to Canton also.

8) The two 2500 gallon tanks; one waste solvent tank and one waste water, had been emptied, but lots of residue was spilled on the ground and in the diked area.

Conclusion:

1) Prismo must excavate the pit and properly close the area around the waste solvent tanks and the caustic waste tank.

2) Must verify that the diked area around the 2 - 8000 gallon caustic waste water tanks is all concrete.

3) Must provide complete manifest to verify proper disposition of all waste.

Recommendations and Follow-Up Requried:

Send letter and conduct follow-up in June or before.

Reviewed By: .... George Harris 3-22-85

Attachments:......................... None

GG:ed (4166B)

Reference, 10

File: Prismo Universal Prismo-Y

RECEIVED

DEC 3 1982

ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

Mr. Moses N. McCall, III
Chief Land Protection Branch
270 Washington Street, S. W.
Atlanta, Georgia 30334
Attention: Gwendolyn Glass

Dear Mr. McCall:

Prismo Universal is in receipt of your August 12, 1982, Part B Permit request as well as your October 18, 1982, Notice of Violation. As a result of these actions, Prismo Universal has re-evaluated its waste storage and containment procedures and have elected to ship all hazardous wastes, as listed in our Part A Permit, off-site to a permitted disposal facility. All waste products shall be stored on-site for less than 90 days.

As a result of the above-referenced procedure, Prismo Universal is requesting that our Part A Hazardous Waste Permit be withdrawn.

In order to assure compliance with appropriate RCRA and State of Georgia regulations, we are taking the following steps:

1.) All containers (drums) shall be dated in order to allow verification by state inspectors of number of days drums are stored on-site. Containers or drums shall not remain on-site more than 89 days.

2.) All tanks containing hazardous wastes shall be completely emptied every 89 days or less.

3.) All waste manifests shall be available for immediate inspection by Georgia EPD Officials. In addition, Prismo Universal shall submit copies of all waste manifests to Georgia EPD for a 6 month period beginning November 23, 1982.

It is our understanding that in withdrawing our Part A Permit and by complying with the above procedures, Prismo Universal will no longer be required to comply with the Part B Permit requirements and the Part 265 Regulations as noted in your October 18, 1982, letter.

We appreciate your cooperation in this matter and look forward to hearing from you soon.

Sincerely

Harris Friedman

Prismo Universal 767-0564

WEH:sea

cc: Mr. Bill Harris
Stottler Stagg and Associates

Reference 11

7

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET S W
ATLANTA, GEORGIA 30334

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

January 24, 1983

Mr. Harris Friedman
Prismo Universal
2675 Martin Street
East Point, GA 30344

RE: Request for Facility Status Changes for Prismo Univeral, East Point, GAD088935960

Dear Mr. Friedman:

This will acknowledge receipt of your request for withdrawal of your application for a Hazardous Waste Facility permit.

Based on the information provided, withdrawal of your application is warranted and your permit application has been placed in our inactive files.

Please be advised that withdrawal of your permit application invalidates any variance that you received to continue existing hazardous waste treatment storage or disposal during the permit review process and that based on our concurrence with your withdrawal request, the Federal Environmental Protection Agency will terminate your facility's interim status.

Should you wish to treat, store, or dispose of hazardous waste in the future, it will be necessary that a hazardous waste handling permit be issued, prior to the construction of such facilities, under authority of Section 8 of the Georgia Hazardous Waste Management Act and paragraphs .10 and .11 of Georgia's Rules for Hazardous Waste Management, Chapter 391-3-11.

If further clarification is needed on this matter, please feel free to contact Ms. Gwendolyn Glass at 404/656-2833.

Sincerely,

John D. Taylor, Jr.

John D. Taylor, Jr.
Program Manager
Industrial & Hazardous Waste
Management Program

JDT:ggk:2178C
cc: James H. Scarbrough
Moses N. McCall, III
File: Prismo Universal (Y)

Reference 12

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET S W
ATLANTA GEORGIA 30334

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

June 15, 1983

TRIP REPORT

Site Name and Location: Prismo - Universal, East Point, GA

Trip by: Gwen Glass GG

Accompanied by: Bert Langley

Date of Trip: February 14, 1983

Officials Contacted: Mr. Edward Pesavento, Mr. Harris Friedman

Reference: Complaint #

Comments:

Inspected this facility reference a complaint from a (b) (6) . He reported this observation was made on Saturday, June 15, 1983. Apparently drums were deliberately being dumped in drum storage area and running into city sewer. Upon inspection of this facility, not only had drums been dumped but also a continous flow of caustic was running into the sewer. Two (2) tanks were over flowing into diked area. Several bricks had been removed from diked area and the caustic was continually flowing down the property into a manhole on Martin Street. Friedman insisted that this was not a waste and that this caustic was reused. This caustic process had not been diccussed during previous inspections. Mr. Lyle, manufacturing Manager said the waste was going from the manhole across Norman Berry into a little creek. Time did not allow us to find this site.

A sample was collected on the same date but results are not yet available.

Conclusions:

Facility is in violation of Rules and Regulation. Facility is possibly in violation of Water Quality Rules and Regulation.

Recommendations and Follow-up Required:

Write letter citing violations and and advise prismo to cease said violations.

Photographs:

Reviewed by: JBB 6/28

Attachments:

GGb:322

File: Prismo(R)

File

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET S W
ATLANTA, GEORGIA 30334

June 8, 1983

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Edward J. Pesavento
Production Manager
Prismo Universal
2675 Martin Street
East Point, GA 30364

RE: Notice of Violation

Dear Mr. Pesavento:

The Environmental Protection Division received a complaint on February 2, 1983 in regard to improper disposal of hazardous waste at Prismo Universal. Ms. Gwendolyn Glass and Mr. Bert Langley, both of this Division, investigated the complaint on February 14, 1983, took samples and confirmed the complainants allegations by noting a continuous discharge of caustic sludge into a manhole adjacent to your hazardous waste storage facility. This activity constitutes violation of Georgia's Hazardous Waste Management Act of 1979, and the Rules for Hazardous Waste Management, Chapter 391-3-11.

The following violations were noted:

391-3-11-.10, 40 CFR 265.192(d) General operating requirements because tank is not equipped with a means to stop the inflow of hazardous waste and consequently gross amounts of waste were overflowing into diked areas.

391-3-11-.10, 40 CFR 265.194(a)(1) Inspections because owner or operator failed to inspect discharge control equipment at least once each operating day, to insure that it is in good working order.

391-3-11-.10, 40 CFR 265.194(a)(3) Inspections because owner or operator failed to check level of waste in tank at least once each operating day to insure compliance with 265.192(c).

391-3-11-.10, 40 CFR 265.194(a)(4) Inspections because owner or operator failed to inspect construction materials of the tank at least weekly to detect leaks.

391-3-11-.10, 40 CFR 265.194(a)(5) Inspections because owner or operator again failed to inspect construction materials of dikes at least weekly to detect obvious signs of leakage.

391-3-11-.10, 40 CFR 265.15(c) General inspection requirements because owner or operator failed to correct above referenced malfunctions before waste was released to the environment.

Further, the contaminated soil adjacent to the drum storage area needs your immediate attention. The subject area must be excavated to remove all contamination and must be properly disposed of in a permitted hazardous waste disposal site.

Of course, it is the responsibility of the Division to insure the protection of the public health, safety, and well being of its citizens, and to protect the quality of Georgia's environment through proper management of hazardous waste. Therefore, you are required to make necessary changes to bring your facility back in compliance. Please submit documenting information to verify that you have properly disposed of subject waste and that other violations are corrected by June 21, 1983.

If further assistance is needed reference this matter, please contact Ms. Gwendolyn Glass at 404/656-7802.

Sincerely,

John D. Taylor, Jr.
Program Manager
Industrial & Hazardous Waste
Management Program

JDT:ggk:0295M

File: Prismo (R)

Ground Water of the Piedmont and Blue Ridge Provinces in the Southeastern States

By H. E. LeGrand

GEOLOGICAL SURVEY CIRCULAR 538

Washington 1967

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ILLUSTRATIONS

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Ground Water of the Piedmont and Blue Ridge Provinces in the Southeastern States

By H. E. LeGrand

INTRODUCTION

This circular summarizes the underground water conditions in the Piedmont and Blue Ridge provinces of the Southeastern States—the region shown on the geologic map (fig. 1).

There are several ways of developing water from the ground in this region. In earlier days springs were used because they are common in coves or on lowland slopes. Almost all springs in the region yield between ½ to 3 gallons per minute and rarely show a significant decline in yield during dry weather. Dug wells were common in the past, but they are being replaced by bored and drilled wells. Bored wells, like dug wells, are as much as 2 feet in diameter and are commonly lined with concrete or terra cotta pipe; these wells do not extend into hard rock and go dry if the water table falls below the bottom of the well. Drilled wells, which are now the most common source of ground-water supply and which are the chief concern of this report, are cased to the hard rock and extend as open holes into the rock. Although some drilled wells are as small as 2 inches in diameter and others are as large as 10 inches, the most common size is about 5 or 6 inches. Almost every well in recent years has been properly constructed to prevent water on the ground from running down the outside of the casing into the well.

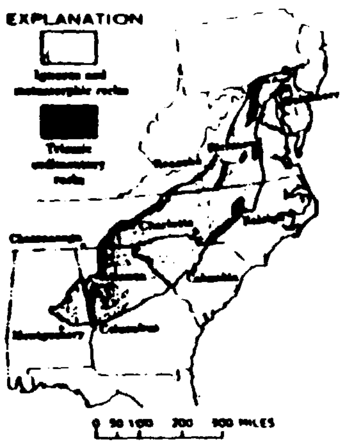


Figure 1.—Generalized geologic map. Areas underlain by igneous and metamorphic rocks are better suited to numerical rating of well sites than areas underlain by Triassic sedimentary rocks

EVALUATING SITES

A special attempt is made to help those who are interested in the yields of wells. Because yields of individual wells in the region vary greatly within distances as short as 100 feet, estimates of potential yields of prospective wells are difficult to make. This fact has led frequently to water shortages, excessive costs, inconveniences, or undue anxiety in many cases. As the yield of a well is unpredictable, the next best approach is to attempt to show, on a percentage basis, the chance for a certain yield from a well for different conditions.

Although many factors determine the yield of a well, two ground conditions, when used together, serve as a good index for rating a well site. These conditions are topography and soil thickness. The ratings are based on the following statement: High-yielding wells are common where thick residual soils and relatively low topographic areas are combined, and low-yielding wells are common where thin soils and hilltops are combined. By comparing conditions of a site according to the topographic and soil conditions one gets a relative

rating value. For example, the following topographic conditions are assigned point values:

Points	*Topography*
0	Steep ridge top
2	Upland steep slope
4	Pronounced rounded upland
5	Midpoint ridge slope
7	Gentle upland slope
8	Broad flat upland
9	Lower part of upland slope
12	Valley bottom or flood plain
18	Draw in narrow catchment area
20	Draw in large catchment area

Figure 2 shows values for certain topographic conditions. Figure 3 shows rating values for soil thickness. The soil zone in this report includes the normal soils and also the relatively soft or weathered rock. The topographic conditions and soil conditions are separately rated, and the points for each are added to get the total points which may be used in table 1 to rate a site.

Using two well sites, A and B, as examples, we can evaluate each as to the potential yield of a well. Site A, a pronounced rounded upland (4-point rating for topography in fig. 2) having a relatively thin soil (6-point rating for soil characteristic in fig. 3), has a total of 10 points. In table 1 the average yield for site A is 6 gpm (gallons per minute). This site has a 65-percent chance of yielding 3 gpm and a 40-percent chance of yielding 10 gpm. Site B, a

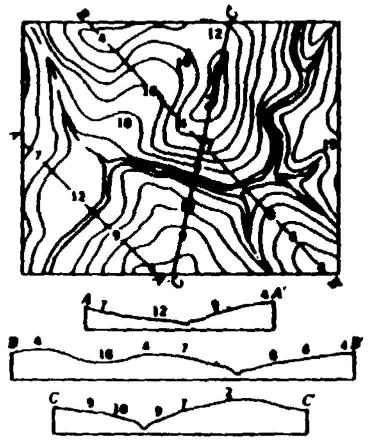
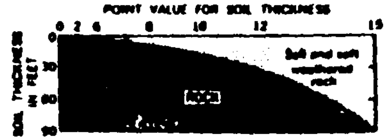


Figure 2.—Topographic map and profiles of ground surface showing rating in points for various topographic positions.



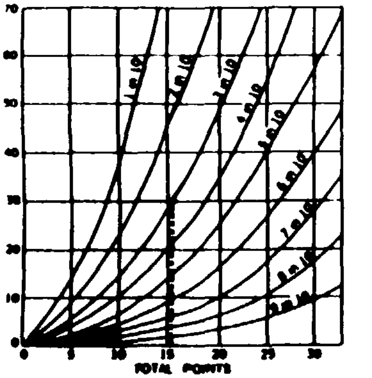
POINT VALUE	CHARACTER OF SOIL AND ROCK
0–2	Bare rock—almost no soil
2-6	Very thin soil—some rock outcrops
6–9	Soil thin—a few rock outcrops
9–12	Moderately thick soil—no fresh outcrops
12-15	Thick soil—no rock outcrops

Figure 3.—Rating in points for various conditions of soil thickness.

Table 1.—*Use of numerical rating of well site to estimate the percent chance of success of a well*

[Data are based on maximum depth of 300 feet or maximum drawdown of water level of about 200 feet. No interference from pumping is assumed. Numerical rating is obtained by adding rating in points for topography and soil thickness]

Total points of a site	Average yield (gpm)	Chance of success, in percent, for a well to yield at least—				
		3 gpm	10 gpm	25 gpm	50 gpm	75 gpm
5	2	40	18	6	2	------
6	3	50	20	7	3	------
7	3	55	25	8	3	------
8	4	55	30	11	3	------
9	5	60	35	12	4	------
10	6	65	40	15	5	------
11	7	70	43	19	7	------
12	9	73	46	22	10	------
13	11	77	50	26	12	------
14	12	80	52	30	14	------
15	14	83	54	33	16	------
16	16	85	57	36	18	------
17	17	86	60	40	20	12
18	20	87	63	45	24	15
19	23	88	66	50	25	18
20	26	89	70	53	27	20
21	28	90	72	54	30	22
22	31	91	74	56	35	24
23	34	92	76	58	38	26
24	37	92	78	60	40	29
25	39	93	80	62	43	32
26	41	93	81	64	46	36
27	43	94	82	66	48	40
28	45	95	83	68	50	42
29	46	95	84	71	53	44
30	50	96	87	73	56	47
30+	50	97	91	75	60	50



Example: A site with 16 points has 3 chances in 10 of yielding at least 30 gallons per minute and 6 chances in 10 of yielding 10 gallons per minute

Figure 4.—Probability of getting a certain yield from a well at different sites having various total-point ratings.

draw or slight sag in topography (18-point rating) having a moderately thick soil (12-point rating), has a total of 30 points, an average yield of 50 gpm, and a 73-percent chance of yielding 25 gpm. Referring to figure 4, we see that the 10-point site has less than 1 chance in 10 of yielding 40 gpm whereas the 30-point site has better than an even chance of yielding 40 gpm.

Some topographic conditions of the region and a few topographic ratings are shown in figure 5. Wells located on concave slopes are commonly more productive than wells on convex slopes or straight slopes. Broad but slight concave slopes near saddles in gently rolling upland areas are especially good sites for potentially high-yielding wells. On the other hand, steep V-shaped valleys of the gully type may not be especially good sites, and they should be avoided if surface drainage near the well is so poor that contamination is possible.

More difficulty is likely to occur in rating character of soil and rock than in rating

Figure 5.—Countryside in the Blue Ridge province showing approximate ratings for topography.

Figure 6.—The soil zone is likely very thin near these rock outcrops (soil-thickness rating 0 to 4 points).

topography. Everyone should be able to determine by observation if the soil is thin (less than 7 soil and rock points as shown in figure 6) and if the soil is fairly thick (more than 10 soil and rock points), but the intermediate ratings are difficult to make. If the observer is unsure of the soil and rock rating above the 6-point (thin soil) value he may choose a 10-point value for the site with assurance that he is fairly correct. White quartz of flint, which occurs as veins and as rock fragments on the ground, is not considered a true rock in this report because it persists in the soil zone; a quartz vein in many cases is considered to be a slightly favorable indication of a good well site.

The numerical rating system is not intended to be precise. One person may rate a particular site at 15 points, whereas another person may rate it at 17 points; such a small difference in rating would not be misleading. Almost everyone's rating will be within 5 points of an average rating for a site.

YIELD

The term "yield" is not definite but is the reported capacity of a well to produce water, generally during a short pumping test. The water level in a well will stabilize if a certain limited yield or withdrawal of water is maintained; however, a greater withdrawal or yield will cause the water level to fall. In many cases the water level continues to fall until the pumping stops so that continuous pumping would result in a smaller yield than that estimated earlier. The percentage of relative yield is not directly proportionate to the percentage of drawdown of the water level, but the greater percentage of yield is reached before the greater percentage of drawdown. Figure 7 shows an approximate relation of drawdown to yield for an average well in the region. Note that the yield-drawdown relationships of all wells lie within the shaded zone and that average conditions occur on or near the heavy line. As an example of the relation between yield and drawdown, we may consider a well 220 feet deep having a static water level of 20 feet below land surface. (See fig. 8.) This well yields 60 gpm with a pumping level at a depth of nearly 220 feet; the pump might better be set at 120 feet (50 percent of drawdown or half the thickness of the water) where about 38 gpm or 80 percent of the relative yield could be realized. It is unnecessary and uneconomical to lower the water level of a well to a position near the bottom unless the yield is so poor that the water stored in the well is needed.

There is no simple definition of the yield of a well—especially in the Blue Ridge and Piedmont provinces. Yields for various levels of the water in the pumped well are rarely known. The yields in this report are considered to be standard for wells about 300 feet deep which are pumped about 12 hours each day and in which drawdown of the water level is about 300 feet; it is assumed that there is no interference by pumping from other wells, which would increase drawdown.

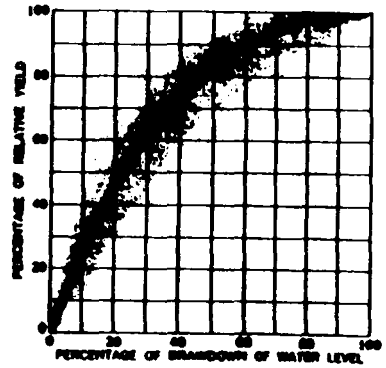


Figure 7.—The curve shows that an increase in yield of a well is not directly proportionate to an increase in drawdown of the water level. A yield of nearly 80 percent of the total capacity of a well results from lowering the water level only 40 percent of the available drawdown.

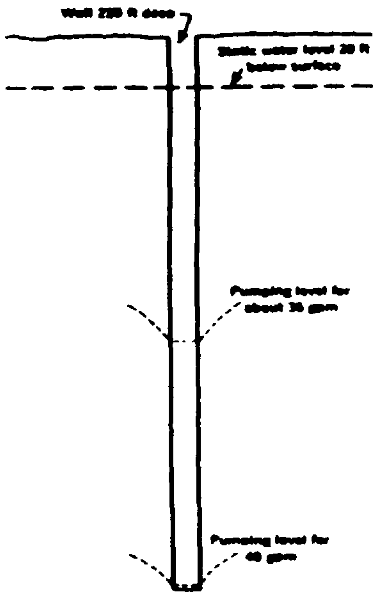


Figure 8.—Yield of a well at two different pumping rates.

DEPTH OF WELLS

How deep should a well be drilled? This question is not easy to answer for an individual well. In most places fractures in the rock get smaller and fewer with depth and deep drilling may not be economical. Figure 9 shows the percentage of total yield for certain depths in an average well.

The following table shows the percentage of wells that reach their maximum yields at certain depths below which drilling is useless. As

Depth (feet)	Percentage of wells
50	15
100	30
150	50
200	70
300	85
400	90

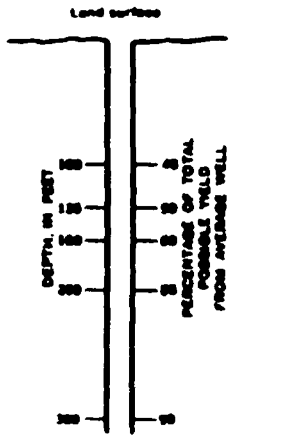


Figure 9.—Extent to which deepening of average well increases the yield.

most of the interconnecting fractures occur in a zone no deeper than 150 feet below the land surface, it may be wise to drill no deeper than 150 feet if the yield is very poor, or no deeper than 300 feet in almost all cases.

FRACTURES IN THE ROCK

Figure 10 illustrates six different fracture patterns in rocks penetrated by wells. To simplify the illustrations the water table and soil thickness are considered uniform, and each well, cased to 50 feet, is 250 feet deep. The approximate number of times each general pattern of fractures occurs in 100 wells is shown in percentage beneath each type. Well A penetrates no fractures below the casing; therefore, the well yields no water. Well B penetrates a fracture zone in which two or more fractures occur a few feet below the casing. This type of well is common. It may yield as much as 10 to 20 gpm for a period of several minutes until the fractures are drained. Then its yield will likely decline suddenly, and the amount of decline will depend upon the amount of water transmitted to the well by the soil and the underlying thin zone of fractured rock. That part of the well below the fracture zone contributes no water and acts only as a storage reservoir into which water drains. The yield of this well does not increase with increased drawdown. Well C penetrates only one fracture, a large one near the

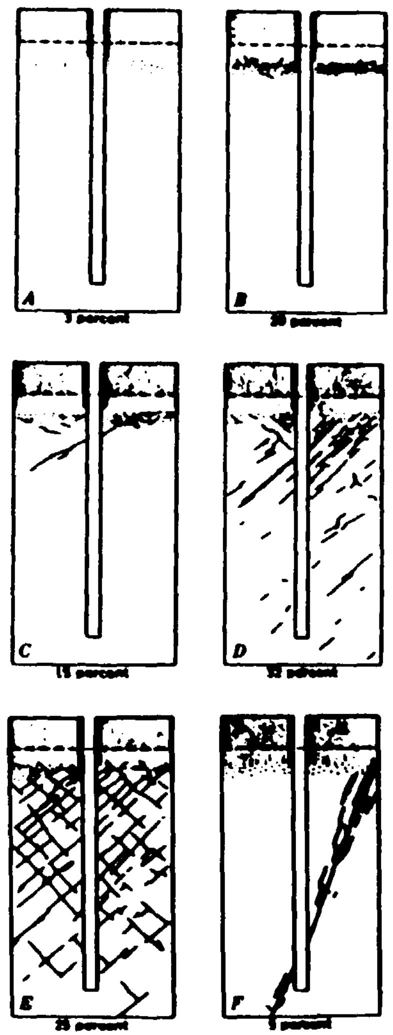


Figure 10.—Six types of ground conditions showing distribution of fractures that influence the yields of wells. The stippled pattern represents soil and soft rock; the dashed line is the water table. The degree of frequency of the different types is shown in percentage.

top of the fresh rock. This well is similar to well B. It may yield considerable water for a few minutes until the stored water in the fracture is drained. The perennial yield, under continuous pumping, will depend on the permeability of the soil and weathered rock and on the amount of water that is released to the fracture. Well D penetrates several fractures, which contribute small amounts of water, and a large fracture at a depth of about 90 feet. Well E penetrates several small- to medium-sized fractures. These fractures are larger and more closely spaced in the upper part of the bedrock. Well F penetrates only one fracture—a large one below a depth of 200 feet.

WATER TABLE

The water table, or upper surface of the underground reservoir, continuously fluctuates and reflects changes in underground storage. During droughts we see evidence of a falling water table when many shallow wells go dry. We also can detect a lowering of the water table locally around wells from which water is pumped. There is a continual discharge of ground water by seepage into streams, by evaporation, and by transpiration through vegetation. The discharge causes a gradual lowering of the water table except for periods during and immediately after significant precipitation when recharge to the underground reservoir exceeds the discharge from it and the water table rises. Figure 11 shows the trends of water-level fluctuation in a well at Chapel Hill, N. C. The water level in this well is controlled entirely by natural conditions, and its fluctuation is typical of that in the region. There is a characteristic seasonal change in the water table, which begins to decline in April or May owing to the increasing amount of evaporation and transpiration of plants. In November or December, when much of the vegetation has become dormant, the precipitation first makes up the summertime soil-moisture deficiency and then again becomes effective in producing recharge, and the water table begins to rise. In a year of normal rainfall the recharge to the underground reservoir is approximately equal to the discharge from it, so that the water table

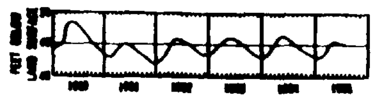


Figure 11.—The water table generally declines in summer and fall but rises to a high level in early spring, as shown by the record of this well in Chapel Hill, N. C.

Table 2.—Concentrations of chemical constituents and their characteristic effects on water use in the region

[Concentration in parts per million except as indicated. Occurrence, where noted, is given in parenthesis after concentrations]

Constituents	Concentration	Characteristic effects on water use
Silica (SiO_2)	Rarely less than 15 or more than 45, commonly 20 to 35.	Forms hard scale in pipes and boilers but not normally a serious problem in the region.
Iron (Fe)	Commonly less than 0.3 in natural water, but corrosion of iron pipes from water with pH less than 6.8 causes a fairly common iron problem.	More than 0.3 ppm stains laundry, utensils, and fixtures reddish brown.
Calcium (Ca) and magnesium (Mg)	Rarely less than 5 or more than 60 (commonly 5 to 20 in water beneath light-colored soils and 15 to 30 in water beneath dark-colored soils).	Cause most of the hardness and scale-forming properties of water. (See hardness below.)
Bicarbonate (HCO_3)	Rarely less than 15 or more than 150, commonly 30 to 100.	Concentrations in region are not generally high enough to cause trouble.
Sulfate (SO_4)	Rarely less than 1 or more than 100, commonly 1 to 40.	Concentrations in region are not generally high enough to cause trouble.
Chloride (Cl)	Rarely less than 1 or more than 40, commonly 1 to 20.	Salty taste to water having more than a few hundred parts per million.
Fluoride (F)	Rarely more than 1, commonly 0.0 to 0.8.	Concentration between 0.6 and 1.7 ppm in water retards decay of teeth, but amounts in excess of 1.5 ppm may cause mottled enamel of teeth.
Nitrate (NO_3)	Rarely more than 20, commonly less than 10.	Where concentration is greater than 20 ppm, contamination from sewage may be suspected. Water of concentrations greater than 45 ppm may be harmful to babies.
Dissolved solids	Total of all mineral matter rarely exceeds 250, commonly 70 to 150.	Water containing more than 1,000 ppm of dissolved solids is unsuitable for most purposes.
Hardness as equivalent $CaCO_3$	Rarely less than 10 or more than 150 (commonly 10 to 30 in water beneath light-colored soils and 40 to 200 in water beneath dark-colored soils).	Causes consumption of soap before lather will form. Hard water forms scale in boilers and hot water heaters. Water whose hardness is less than 60 ppm is considered soft; 61 to 120 ppm, moderately hard; 121 to 180 ppm, hard; more than 180 ppm, very hard.
pH	Rarely less than pH of 5.5 or more than 7.5 (commonly 5.5 to 6.8 in water beneath light-colored soils and 6.8 to 7.5 in water beneath dark-colored soils).	Values less than 7.0 indicate acidity, and corrosiveness of water generally increases with decreasing pH.

at the end of the year is at about the same level as at the beginning of the year. Wells drilled into rock may, when pumped at full capacity, yield slightly less during the driest part of the year when the water table is low. Yet there appears to be no evidence to support the general belief that the water table has been declining during recent years.

CHEMICAL QUALITY OF THE WATER

In comparison with ground water in widely scattered regions of the world, the water in the Piedmont and Blue Ridge provinces ranks among the best in chemical quality. (See table 2.) Most of the water is low in total dissolved solids and is generally soft, but some is moderately hard.

Iron in water is the most common complaint. As little as 0.4 ppm (parts per million) will cause a red stain on plumbing fixtures. About 5 of every 10 wells yield water with less than 0.3 ppm of iron. About 4 of 10 wells yield water with just enough iron to cause a slight stain, and about 1 of 10 wells yields water that has considerable iron. Some iron problems result when iron is dissolved from rocks, and other problems result when water, moving through iron pipes, consequently picks up a brown iron stain by corrosion. It is important to determine the source of the iron, whether dissolved from the rocks or from the pipes, before methods for its removal are employed. Most of the water is satisfactory for use without any type of treatment (table 2). Yet an analysis of the water should be made as soon as a well is drilled to determine if treatment is necessary. It is not possible to determine the quality of water before a well is drilled.

CONTAMINATION OF GROUND WATER

In view of the many hundreds of thousands of wells that are interspersed with about an equal number of septic tanks and other waste sites, it is proper to give serious attention to the possibility of contaminating an individual water supply. The tendency for ground water—and contaminants that might be in it—to move naturally from upland areas toward stream valleys offers help in planning wells and waste sites to avoid contamination. A well that is pumped may modify the natural movement of water and draw contaminated water toward it; this condition is more likely where the soil is thin or absent than where it is thick. Care should be taken to see that no water from the land surface can seep easily into the well around the casing. Not only is the well site important but so is the waste site. In most cases the chances of contaminated water from a waste site moving into a well are not easy to predict, but a few general statements can be made. For example, at a waste site (1) a deep water table is safer than a shallow water table, (2) thick soil is safer than thin soil or rock outcrops, (3) sandy soil with some clay may be better than a clean sandy soil or a sticky clay soil, and (4) a slope of both the land surface and the water table away from a well is better than one toward it.

The soil and weathered rock are generally effective in preventing waste materials from passing through to underlying rock fractures, but the combination of (1) certain types of wastes, (2) excessive quantities of disposed wastes, and (3) thin soils may result in contaminated water reaching bedrock fractures. Once in the bedrock fractures the contaminated water may move easily to water supplies. Only a small percentage of wells have been contaminated, but proper care in locating and constructing wells and waste sites must be taken to minimize the risk of contamination. Minimum standards specified by health officials, such as those relating to permeability of the soil, distance between a well and a waste site, and depth of the water table, must be followed.

GENERAL STATEMENTS ABOUT GROUND WATER IN THE REGION

1. Ground water may be considered as occurring in an underground reservoir, the water being held in the open spaces of the rock materials. The water table, representing the top of the reservoir, generally lies in the clay, or disintegrated rock materials. In the lower part of the reservoir, water occurs in interconnecting fractures in bedrock; the fractures diminish in number and size with increasing depth. Water enters the fractures by seeping through the overlying clay, and drilled wells draw water from these fractures. The source of this water is precipitation in the general area of a well and not in some remote place.

2. A layer of residual soil and weathered rock lies on the fresh rock in most places; the thickness of the soil and weathered rock ranges from zero to slightly more than 150 feet.

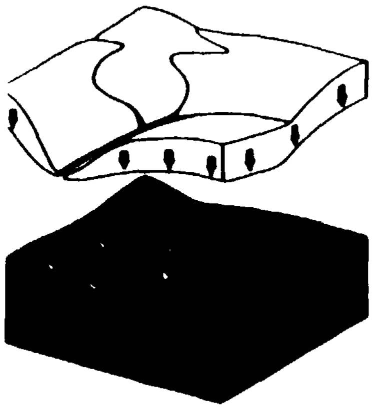


Figure 12.—Dry zone (above water table) lifted up to show water table as surface of saturated zone. Movement of water (arrows) tends to be downward in the dry zone and lateral toward streams in the saturated zone.

3. The water table has a hill and valley relation that approximately conforms with surface topography, although the water table is somewhat flatter. (See fig. 12.) For example, a creek or river is the surface expression of the water table in a valley, but beneath a hill the water table may be 30 to 70 feet below the ground surface. Ground water, like surface water, has the tendency to drain away from the hills to the valleys. This tendency helps in planning the location of wells in relation to other wells and to sources of possible contamination.

4. A close network of streams prevails, and in most places on an upland area a perennial stream is less than 1 mile away.

5. Toward the streams is a continuous flow of ground water. Some of the outflowing ground water is used up by evaporation and by transpiration of plants in the valley areas; the remainder of the water discharges as small springs and as bank and channel seepage into the streams.

6. The natural movement of ground water is relatively short and is almost everywhere restricted to the same underlying the gross topographic slope extending from a particular land-surface divide to the adjacent streams.

7. In ideal cases the pumping of a well causes the water table to be depressed smoothly in the shape of an inverted cone, the apex of the cone being in the well; however, the erratic distribution of rock fractures and the contrasting nature of permeability between rock fractures and overlying soils cause the depressed part of the water table to extend unevenly around a well. Where two heavily pumped wells are within a few hundred feet of each other, there is a strong likelihood of some interference of pumping level between the two, but in most cases there is not any appreciable interference between low-yielding wells a few hundred feet apart. From a pumped well the depressed part of the water table rarely extends beneath a perennial stream or beneath a hilltop to a slope on the opposite side. Well interference is local, and there is no regional lowering of the water table because of pumping.

8. The relation of the depth of a well to yield of the aquifer is not simple. In spite of some beliefs, water already available to a well is rarely lost by drilling deeper; therefore, there is always a chance of getting a larger supply by increasing the depth of the well. Yet this chance becomes poorer as the well deepens because the interconnecting fractures and the ability of the rocks to store and transmit water decrease significantly with depth. More than 90 percent of all ground water occurs in the first 100 feet below the water table. Generally two wells 200 feet deep each will yield more water than one well 400 feet deep.

9. The relationship of topography to yield is emphasized. The great majority of wells are located on hills or smooth upland slopes because of convenience and because these locations appear safe from sources of contamination. Yet the percentage of low-yielding wells is much greater on hills and upland convex slopes than in lowlands or draws (concave slopes that lead upward from a valley to a saddle or sway-backed position in a ridge). Steep-sided depressions, such as gullies and ravines, should not be considered acceptable sites for wells.

10. In general, wells are more productive and tend to have a more stable year-round yield where there is a thick mantle of soil than where bare rock crops out. The presence of a soil cover and the absence of rock outcrop suggest that water moves downward into the rock and is not readily shunted toward the adjacent valley; in fact, the soil cover suggests that interconnecting rock fractures are available to store water and to transmit it to wells. Where there is a good soil cover, the water table generally lies in it; therefore, the storage capacity in the vicinity is much greater than where bare rock is exposed and where the only water in storage is in the rock fractures that might be quickly drained.

11. Simple clear-cut statements about the water-yielding properties of the various types of rocks are not easy to make. There are many varieties of igneous and metamorphic rocks, but for a discussion of their ground-water properties they may be grouped as follows: (1) Somewhat massive igneous rocks, such as granite, and (2) metamorphic rocks, such as schists, gneisses, and slates, which may show an alinement of minerals or an alinement of cleavage planes or openings along which water may move. In some places a type of rock may have distinctive water-bearing characteristics, but, if so, it is also likely to show distinctive topographic and soil-mantle features. Topography and soil-mantle features are readily observed and may be used as criteria for predicting the water-yielding potential of a well site, whereas the water-bearing characteristics of a type of rock by itself may be obscure. At any rate, there are too many complex factors involved to justify generalizations about the yield of wells in individual types of rock.

12. Whenever water is pumped from a well, the water level is lowered in and around the well. The drawdown increases with an increase in the rate of pumping, although this relation is not simple. For example, a well yielding 20 gpm with a drawdown of 50 feet will not double its yield by increasing the drawdown to 100 feet. Instead, it will yield less than 40 gpm and perhaps no more than 25 to 30 gpm with a drawdown of 100 feet.

13. Some wells that are pumped heavily tend to decline gradually in yield. This fact may be due to the following circumstances. The size and setting of a pump are determined from a short bailer or pumping test when the well is completed. Such a short test may not indicate the long-term yield of the well because the first water is withdrawn form storage in the rock materials, and many hours, days, or even months may pass before there is a stable adjustment between the amount of water that the fractures can feed into the well and the amount of water available to drain through the overlying clay into the fractures feeding the well. Failure to have knowledge of water-level fluctuations as a result of pumping is the cause of many well problems and of the erroneous conclusion that well supplies are not dependable. If a well tends to have an unstable yield, it is probably overpumped. A reduction in the rate of pumping and consequently a raising of the water level will result in a perennially safe yield. Constant pumping at a moderate rate does not damage a well.

14. There is a tendency for rocks underlying a light-colored soil to yield water that is low in dissolved mineral matter and is soft. On the other hand, rocks underlying darker soils (dark red, brown, and yellow) tend to yield water that is slightly hard, or hard, and that may contain objectionable amounts of iron.

15. Many people think that a shallow depth to the water table is an indication of a good yield of a potential well, but this is not a rule to follow. In fact, where the water table is only a few feet beneath the land surface on an upland area, the rock fractures may be so scarce that water may not be able to move downward in the rock; it is held near the ground surface and perhaps is shunted out to the land surface as a wet seepage spot on a steep slope.

16. There are many mistaken notions about the availability of ground water in the region. These notions arise from lack of knowledge of the occurrence and movement of ground water and of the behavior of wells. The common erroneous statement that a certain town in the region could not depend on well water stems from the existence of a limited number of wells; never has the underground reservoir beneath any town or city in the region been completely depleted of its water. There has been a tendency for towns of about 2,000 people to convert from well supplies to a treated surface-water supply; such conversion commonly occurs when the town requires more than 300,000 gallons of water per day, an amount which only a few wells in aggregate may not produce. Few towns have the experienced persons with diversified knowledge of wells and ground-water conditions to provide the good management comparable to that of municipal surface-water supplies.

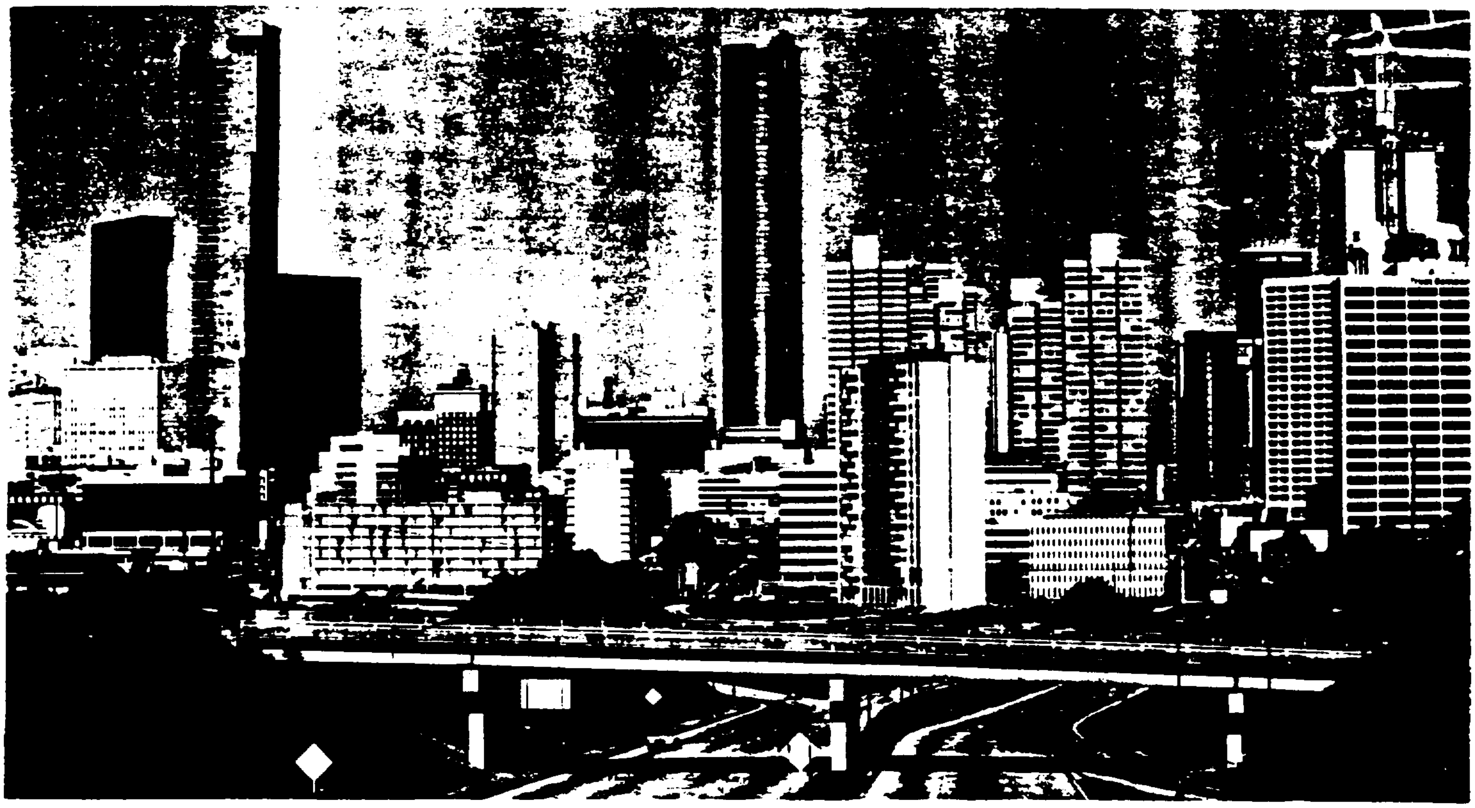
SOURCES OF INFORMATION

There are many sources of information bout ground-water conditions in specific arts of the region. At least one agency in ach State has cooperated financially with the .S. Geological Survey, and these agencies have contributed in some way to the results of this report. Further information about reports published or work in progress may be obtained from the district offices of the Geological Survey in each State or from the respective State cooperating agencies.

Reference 14

GEOLOGY OF THE GREATER ATLANTA REGION

Keith I. McConnell and Charlotte E. Abrams



Department of Natural Resources
J. Leonard Ledbetter, Commissioner

Environmental Protection Division
Harold F. Reheis, Assistant Director

Georgia Geologic Survey
William H. McLemore, State Geologist

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GEOLOGY OF THE GREATER ATLANTA REGION

Keith I. McConnell and Charlotte E. Abrams

ABSTRACT

The oldest rocks present in the Greater Atlanta Region (i.e., Corbin Gneiss Complex) are exposed in the crest of the Salem Church anticlinorium, a major northeast trending fold in the Blue Ridge portion of the study area. Nonconformably overlying these 1 b.y.-old Grenville gneisses are metasedimentary rocks of the Pinelog and Wilhite Formations. These two formations are interpreted as lithostratigraphic equivalents of units within the late Precambrian Snowbird and Walden Creek Groups of the Ocoee Supergroup. Stratigraphically above the Wilhite Formation is a metamorphosed clastic sequence that is interpreted as a lithostratigraphic equivalent of the Great Smoky Group as defined to the northeast of the study area. Rocks of the Murphy belt group are exposed in the Murphy synclinorium conformably above the Great Smoky Group. The Murphy belt group is composed predominantly of a metamorphosed succession of clastic rocks and also includes the Murphy Marble. The Murphy belt group does not extend southwest of the Murphy synclinorium east of Cartersville; however, rocks of the Great Smoky Group trend around the reentrant in the Cartersville fault into what is referred to as the Talladega belt. Units of the Talladega belt in this area are at least partially equivalent to the Ocoee Supergroup and therefore are late Precambrian in age.

Lithologic units of the Blue Ridge are separated from the rocks of the northern Piedmont by the Allatoona fault. The northern Piedmont can be divided into two major lithologic units, New Georgia and Sandy Springs Groups. The New Georgia Group is interpreted to contain the oldest units in this portion of the northern Piedmont and is characterized by a metamorphosed sequence of predominantly felsic and mafic volcanic and plutonic lithologies. The Sandy Springs Group is interpreted to conformably overlie the New Georgia Group and is composed dominantly of interlayered metavolcanic and metasedimentary rocks with a decreasing metavolcanic component upward in the stratigraphic sequence. Eastern and western belts of the Sandy Springs Group are separated by the Chattahoochee fault, a major tectonic boundary in the northern Piedmont.

Northern Piedmont rocks are separated from similar lithologies and stratigraphic sequences in the southern Piedmont by the Brevard fault zone. In the Greater Atlanta Regional Map area, the Brevard zone is a zone of early ductile and late, brittle shearing that is interpreted to have formed, at least in part, as a result of high strain along the axial zone of a large F_1 isocline. No major vertical displacement is apparent along this segment of the Brevard zone.

South of the Brevard fault zone, units defined as Atlanta Group by previous workers are interpreted in this report to be exposed in a large-scale synformal anticline. The Atlanta Group is characterized by metamorphosed sedimentary and volcanic rocks that have many similarities to lithologies north of the Brevard zone. Possible correlations between the Atlanta Group and the New Georgia and Sandy Springs Groups are presented in this report.

Paleozoic plutonic rocks present within the Greater Atlanta Regional Map area are divided into three major categories based upon chemical composition, depth of intrusion and time of intrusion relative to Paleozoic metamorphism. Earliest (category 1) intrusions were emplaced at shallow levels coincident with volcanism, are concordant to the regional trend, and are characterized by dacitic subvolcanic plutons and volcanics. Category 2 plutons were intruded syntectonically, at an intermediate level in the crust, and are characterized by moderately high concentrations of potassium, nearly concordant contacts with the country rocks and a lack of any association with volcanism. Both category 1 and 2 plutons have a metamorphic overprint. The final category of Paleozoic intrusive rocks present in the study area is dominantly granitic in composition, lacks a metamorphic overprint, is discordant to the regional trend and does not have a volcanic component. Plutons of category 3 are known to occur only south of the Brevard fault zone.

Two major regional progressive metamorphic events and seven deformational events have been recognized in the study area. The earliest deformation and metamorphism recognized occurred during the Grenville orogeny (approximately 1,000 m.y. ago) and is reflected only in basement gneisses of the Blue Ridge. The second metamorphic event is interpreted to have occurred approximately 365 m.y. ago and was associated with a major episode of isoclinal recumbent folding (F_1). Axial planar foliation (S_1) associated with this fold event represents the dominant planar feature in crystalline rocks of the area. Folds related to this deformation have not been recognized within the Valley and Ridge west of the Cartersville fault, partially supporting the existence of the fault east of Cartersville. F_2 folding postdated Paleozoic metamorphism and is responsible for the geometry of outcrop patterns in the Greater Atlanta Region. Subsequent folding events (F_3 and F_4) interfere with earlier fold patterns and complicate outcrop patterns of map units.

Twenty-eight commodities have been mined or prospected within the boundaries of the Greater Atlanta Regional Map. Of these various commodities only barite, ocher, sand, granite (dimension stone and crushed), limestone, structural clays, and marble are still being mined. Areas of extensive mining and (or) prospecting include the limestone, bauxite, and shale deposits of Floyd and Polk Counties; barite, ocher, iron and manganese deposits of the Cartersville district; volcanogenic massive sulfide and gold deposits in the northern Piedmont; and crushed and dimension stone from quarries in the Stone Mountain, Panola, Palmetto, and Ben Hill Granites and Lithonia Gneiss south of the Brevard fault zone and in the Austell, Sand Hill, Kennesaw and Dallas gneisses north of the Brevard zone.

ACKNOWLEDGEMENTS

The Atlanta Regional Map project involved many former and present day members of the Georgia Geologic Survey. Special recognition should go to Samuel M. Pickering, Jr., former State Geologist, who originated the Atlanta Regional Map project and to Joseph B. Murray and David E. Lawton who supervised the initial stages of this investigation. Also, we would like to recognize several former members of the Georgia Survey who, since their departure, have given support and guidance in the various areas that they worked. These include John O. Costello, Falma J. Moye, and Robert E. Dooley. In addition, we sincerely appreciate the support and assistance given to us by representatives of the mineral industry. In particular, the efforts of Randy Slater of Tennessee Chemical Corporation in gaining access to core from western Georgia was particularly helpful. Other members of the mineral industry who have assisted us through discussions and chemical analyses will, at their own request, remain anonymous. Outside technical review of the manuscript was by Robert D. Hatcher, Jr., James F. Tull, and James A. Whitney. Stan D. Bearden reviewed the mineral location map for the Cartersville district. Finally, we would like to express our appreciation to Gilles O. Allard and Robert H. Carpenter for their reviews of the economic geology portion of the Greater Atlanta Regional Map report and for their assistance and guidance in our efforts to understand and promote the ore deposits of west Georgia.

INTRODUCTION

Purpose and Methods

This report presents results of the Greater Atlanta Regional Map project, an effort to develop a comprehensive geologic data base for the rapidly growing Atlanta metropolitan area. The primary objective of the Atlanta Regional Map project was to provide a compilation and synthesis of existing and newly derived geologic information for the Greater Atlanta Regional Map area for use by private industry, the general public, and the geological community. A secondary objective of this project was to compile a single-source listing and map of mines and prospects in the Atlanta area primarily for use by the mineral industry. When aspects of mapping related to the Greater Atlanta Regional Map project generated interest from within the mineral exploration community, the economic part of the project was expanded to include a detailed examination of the origin of base and precious metal deposits in the Atlanta area.

The base used for the above-mentioned compilations is the map of the Greater Atlanta Region. The Atlanta map was the first of a new series of 1:100,000 scale topographic maps produced by the U.S. Geological Survey. Unlike 1:100,000 scale maps that followed it, the Greater Atlanta Regional Map was not in the 1° of longitude format. The Greater Atlanta Regional Map encompasses 1 degree, 30 minutes longitude and 1 degree of latitude and is centered on the city of Atlanta (Fig. 1). Ninety-six 7.5-minute quadrangles are contained within the boundaries of the Greater Atlanta Regional Map (Fig. 1) as are portions of three major geologic provinces (i.e., Valley and Ridge, Blue Ridge, and Piedmont).

To produce a geologic map of an area as large as that contained within the Greater Atlanta Regional Map requires an enormous amount of time and money. For that reason, existing geologic literature was reviewed in an effort to find suitable geologic mapping for compilation. Some information used in compilation of the geologic map of the study area (Plate I) was available as open-file maps at the Georgia Geologic Survey. Geologic information also was available from various hydrologic reports and nearly all of the Valley and Ridge portion of the Greater Atlanta Regional Map was compiled from these hydrologic maps.

At the start of this project much of the Blue Ridge and Piedmont contained within the boundaries of the Greater Atlanta Regional Map lacked adequate geologic mapping. A major task of the Greater Atlanta Region project was to provide mapping for these areas. In a cooperative effort, members of the Georgia Geologic Survey, U.S. Geological Survey and the University System of Georgia performed detailed and reconnaissance geologic mapping on 7.5-minute base maps. Detailed mapping generally was reserved for those areas that were exceedingly complex structurally or were of potential economic significance. Detailed petrographic studies were limited to the formal definition of specific lithologic units. Many of these petrographic studies were included in derivative reports and investigations. Chemical analyses of rocks were restricted to selected units. Most of the analytical work reported in this investigation was performed in laboratories of the Georgia Geologic Survey and U.S. Geological Survey, although some analytical work on potentially economically significant units was provided by several mineral exploration companies.

Any compilation of data from multiple sources requires compromises in the handling of differing interpretations and mapping detail in adjacently mapped areas. Also, all areas could not be mapped to the degree that would provide a complete and solid data base for interpretation. This report contains examples of all of these compromises and constraints. In particular, all areas within the study area were not mapped to the same degree of detail (see Appendix D) and, therefore, some compromises regarding lithostratigraphic contacts were necessary. In addition, controversial areas for which more than one interpretation of the geology existed required a judgement as to which interpretation was to be used on the compilation. Justification for the interpretations used are included within the text of this report.

Belt Terminology

Any author of a regional report on the geology of crystalline rocks in the southeast almost immediately encounters the problems related to the "belt" terminology which is commonly used to define the major rock groupings as long, linear belts. Although there is almost universal dislike for the "belt" terminology, terms such as Blue Ridge, Inner Piedmont, Talladega, etc., have become entrenched in the literature and in the minds of Appalachian geologists. The use of these terms has almost become an obligatory part of any manuscript written on the southern Appalachian orogen. Faced with these entrenched terms, authors of reports on crystalline rocks in the southeast must select one of four alternatives when preparing a manuscript: 1) using the belt classification of either Crickmay (1952) or King (1955); 2) using a previously

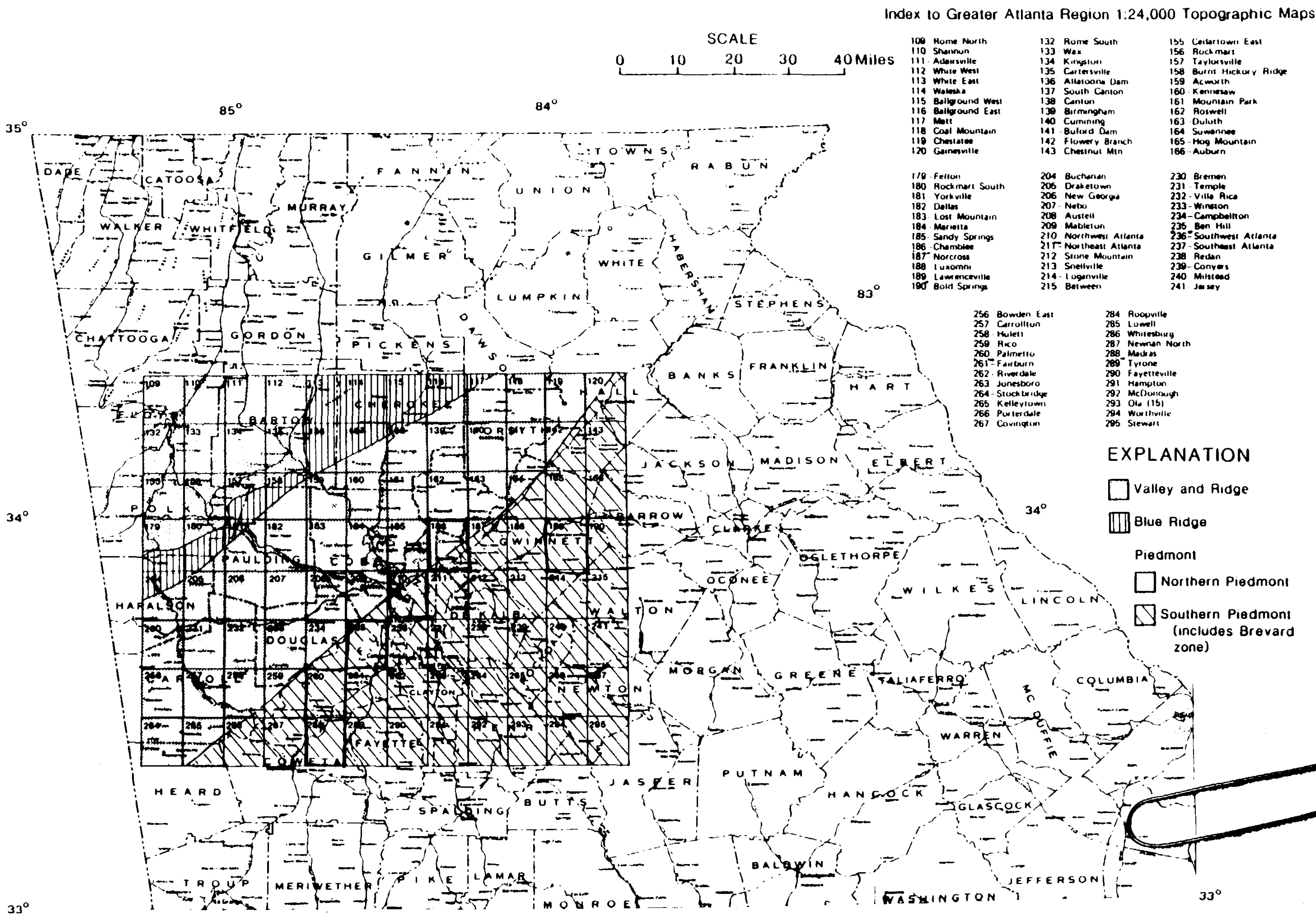


Figure 1. Greater Atlanta Regional Map area with geologic provinces and index to 1:24,000 U.S. Geological Survey topographic quadrangles.

his reports on the Valley and Ridge, Spencer (1893, p. 3) published a compendium on the "scientific, economic, and agricultural standpoints" of the Paleozoic Group in northwest Georgia. More specifically, Spencer (1893) described the geology and mineral resources of Polk, Floyd, Bartow, Gordon, Murray, Whitfield, Catoosa, Chattooga, Walker and Dade Counties.

For a short period of time following Hayes' and Spencer's work, advances in the knowledge of the geology of the Valley and Ridge followed the lines of individual economic mineral studies in a series of bulletins published by members of the Geological Survey of Georgia. Most of these reports covered the occurrence of economic minerals throughout the State with only a portion of the report covering northwest Georgia. Topics covered in these reports include: iron ores in Polk, Bartow, and Floyd Counties (McCallie, 1900); bauxite (Watson, 1904); ocher (Watson, 1906); fossil iron ore deposits (McCallie, 1908); limestones and cement materials (Maynard, 1912); slate (Shearer, 1918); and barite (Hull, 1920). In addition, two reports on manganese deposits of Georgia were produced (Watson, 1908; Hull and others, 1919) as well as a second report on iron ore deposits (Haseltine, 1924). Somewhat later, Smith (1931) published on shales and brick clays of Georgia and Furcron (1942) reported on dolomites and magnesium limestones.

In 1948, a revision of Valley and Ridge stratigraphy was published by Butts and Gildersleeve (1948). Much of these data were incorporated previously into the State Geologic Map of 1939 (Cooke and others, 1939). Butts and Gildersleeve (1948) provided some revisions to the 1939 map and included a section on the mineral resources of northwest Georgia. Kesler (1950) subsequently published his detailed report on the geology and mineral resources of the Cartersville area. In this report, Kesler disputed the existence of the Cartersville fault of Hayes (1901) and revised the Paleozoic stratigraphy in the Cartersville area. An important aspect of Kesler's stratigraphic revision is that he limited the Shady Dolomite to the stratigraphic zone containing interbedded hematite and dolomite. This aspect of Paleozoic stratigraphy will be discussed further in following paragraphs.

Croft (1963) produced the first of two reports on the hydrology of Bartow County in which he indicated that much of the Lower Cambrian sequence was overturned. Shortly after the publication of Croft's report, the Geological Society of Georgia made the Cartersville fault problem and associated Paleozoic stratigraphy the subject of a field trip. In the report published for the field trip, Bentley and others (1966) suggested that the Cartersville fault did not exist south of Bolivar and that quartzites unconformably overlying the Corbin gneiss are Weisner Formation (Chilhowee Group).

Cressler (1970) published a report on the hydrology of Floyd and Polk Counties and McLemore and Hurst (1970) reported on the carbonate rocks of the Coosa Valley area. Cressler and others (1979) published the second report on the geohydrology of Bartow County that also included the geohydrology of Cherokee and Forysth Counties, which lie east of the Cartersville fault. Cressler and others (1979) provided mapping in the Cartersville area and, like Butts and Gildersleeve (1948) and Croft (1963), expanded the limits of the Shady Dolomite to include dolomitic limestones that Kesler (1950) had placed in the Rome Formation. Included in the report by Cressler and others (1979) were the results of mapping in southern Bartow County by Crawford (1977a, 1977b). This mapping outlined the trace of the Cartersville fault through southern Bartow County. Much of the information derived by Cressler and Crawford was presented on the Georgia Geological Society field trip in 1977 (Chowns, 1977).

The first detailed study of the stratigraphy and depositional environments of the lowermost Cambrian rocks in northwestern Georgia was carried out by Mack (1980). Mack's work established the internal stratigraphy for the Chilhowee Group just west of the Cartersville fault and related these findings to the better known Chilhowee Group in Tennessee.

Reade and others (1980) published the results of their investigation in the Emerson-Cartersville area. Most mapping done in that investigation took place in the barite pits of the Thompson-Weinman Corporation. In that report, usage of the term "Shady Formation" is restricted to a black dolostone directly above the ledge-forming quartzites of the Weisner Formation, whereas dolostones above this black carbonate are placed in the Rome Formation. Reade and others' (1980) definition of the Lower Cambrian stratigraphy, which is similar to that of Kesler's (1950) stratigraphy, is an indication of the problems involved with stratigraphic and structural interpretation in the Cartersville area.

BLUE RIDGE

In this report, the term Blue Ridge is limited to those rocks present between the Allatoona fault (McConnell and Costello, 1980b) and the Cartersville fault. As with the Valley and Ridge, the earliest work in the Blue Ridge was done by C.W. Hayes. In 1891, Hayes first reported on faulting in the Cartersville area and introduced the term "Cartersville fault." Hayes (1891) mapped the trace of the Cartersville fault directly through the city of Cartersville possibly coincident with what is now referred to as the White fault. In a subsequent publication Hayes (1901) relocated the fault a few miles to the east. Much of Hayes' work in the Blue Ridge remains unpublished. In his unpublished Cartersville folio, Hayes (1895) outlined the stratigraphy and structure of the Blue Ridge just east of the Cartersville fault and pointed out the nonconformity between the Corbin Gneiss and its cover sequence. In addition, Hayes' map implied equivalence between those rocks overlying the Corbin Gneiss Complex and rocks that were later to be termed Talladega belt rocks (Crickmay, 1952). Hayes' early work and relocation of the trace of the Cartersville fault set the stage for an 80-year controversy over the existence of the fault and the stratigraphy of the sedimentary and crystalline rocks in the Cartersville area. This controversy persists today.

Shortly after Hayes' work, the series of publications by the Geological Survey of Georgia regarding various mineral commodities began. These publications specifically related to Blue Ridge geology include McCallie's (1907) report on the marbles of Georgia, Hull's (1920) report on barite, Prindle's (1935) report on kyanite and vermiculite, and Furcron and Teague's (1945) report on sillimanite and kyanite deposits. During this same period, Bayley (1928) published the geology of the Tate quadrangle and described in detail the various types of Georgia marble. Also, Crickmay (1936) reported on the Talladega Series in the southern Appalachians including that portion of the Blue Ridge in the Greater Atlanta Regional defined modification of these classifications (e.g., Hatcher, 1978a); 3) proposing a new modification of these classifications based upon local considerations; or 4) proposing an entirely new classification. All of the four alternatives listed above have drawbacks, and selection of any one alternative will not meet with universal acceptance. In the report on the Greater Atlanta Region, we have chosen to follow the third alternative and propose a modification of King's (1955) original classification. This modification of King's classification of geologic belts and the reasoning behind it are presented below.

In choosing the third alternative, we have eliminated the other three based on the following considerations. In the 30 years since Crickmay (1952) and King (1955) originally proposed their belt terminology, knowledge of the geology of the crystalline rocks in the southern Appalachians has increased substantially. Detailed mapping has shown that the belts as originally defined are too general, have little relation to physiographic provinces, and have poorly defined boundaries. Because of this, geologists in various parts of the orogen have modified the belt terminology to fit their own particular observations. Thus, Hatcher (1978a) modified King's Blue Ridge by separating it into three subdivisions: an eastern, a central and a western Blue Ridge belt, while Neathery and others (1974, 1975) termed part of what King called Blue Ridge as northern Piedmont. Belt modifications of neither Hatcher nor Neathery are appropriate when applied to major lithologic units of the Greater Atlanta Region. Lithologic units of the study area contain characteristics that lend support to both Hatcher and Neathery's belt modifications, but also do not completely fit either author's modification of King's belts. For the above reason we feel that alternatives 1 and 2 as presented above have more liabilities than good characteristics and therefore have not been used in this report.

The fourth alternative is to propose an entirely new classification based on local considerations. The problem with this alternative is that the terms Piedmont and Blue Ridge have become so entrenched in the literature that it is doubtful that any locally defined terminology proposed would ever reach any significant level of usage or recognition outside of the State of Georgia. An example of this is Crickmay's (1952) terminology which has been largely ignored outside of the state. We, therefore, conclude that the third alternative of proposing a new modification of preexisting terms based on local considerations is the most appropriate.

Rocks of the Atlanta Region in this report are divided into three major geologic provinces (Valley and Ridge, Blue Ridge, and Piedmont) as modified after King (1955). Physiographic terms used for the belt terminology are retained because they are so entrenched in the literature, but it must be emphasized that they have little or no relevance to the physiographic provinces.

In this report the Valley and Ridge geologic province is similar to the Valley and Ridge belt of King (1955). It is composed of the unmetamorphosed to weakly metamorphosed rocks of the foreland fold and thrust belt, but also includes the basal lower Cambrian clastic rocks of the Chilhowee Group (Unaka belt of King, 1955). The southern and eastern boundary of the Valley and Ridge geologic province is the Cartersville fault that separates the relatively unmetamorphosed lower Cambrian lithologies from late Precambrian Ocoee Supergroup lithologies.

The Blue Ridge geologic province as defined in this report bears little resemblance to the Blue Ridge belt as defined by King (1955). King (1955) recognized that the Blue Ridge belt included portions of the Blue Ridge and Piedmont physiographic provinces and generally defined it as comprising the area between the Unaka Mountains on the northwest and the Brevard fault zone to the southeast. King also recognized several less extensive belts in the Blue Ridge, namely the Dahlonega and Murphy belts. Other geologists have been troubled by the broadly defined Blue Ridge belt and have modified it into either several smaller belts (i.e., eastern, central, and western Blue Ridge belts of Hatcher, 1978a) or termed part of King's Blue Ridge belt, northern Piedmont (Neathery and others, 1974, 1975). Hatcher's eastern Blue Ridge belt roughly corresponds with the northern Piedmont as defined in Alabama, with one notable exception: the inclusion of the Talladega belt in the northern Piedmont of Alabama.

In this report on the Greater Atlanta Region we define the Blue Ridge geologic province as covering the area between the Cartersville and Allatoona faults, including rocks of the Talladega and Murphy belts. The Blue Ridge geologic province therefore coincides generally with the rifted continental margin where debris from the continent was deposited (miogeoclinal portion of the orogen).

Rocks lying between the Allatoona fault and Fall Line (Coastal Plain unconformity) are interpreted to lie in the Piedmont geologic province. Since the Brevard represents a prominent feature in this area and separates similar lithologies and stratigraphic sequences, the area north and west of the Brevard fault zone is termed northern Piedmont and that south and east of the Brevard is termed southern Piedmont. The northern Piedmont as defined in this report differs from the northern Piedmont as defined in Alabama in that the former does not include rocks of the Talladega belt. The boundary between Blue Ridge and Piedmont geologic provinces roughly corresponds to the transition from miogeoclinal to eugeoclinal deposition in the Appalachian orogen.

The southern Piedmont as defined in this report would cover the area between the Brevard fault zone and the Coastal Plain overlap. Rocks of the Charlotte and Carolina slate belts are interpreted as subdivisions of the southern Piedmont much as the Talladega and Murphy belts represent subdivisions of the Blue Ridge geologic province.

Previous Works

VALLEY AND RIDGE

As with most of northwest Georgia, earliest reports on the geology of that part of the Greater Atlanta Regional Map area underlain by Valley and Ridge rocks were done by C.W. Hayes (1891, 1901, 1902). In these early reports, Hayes outlined the stratigraphy and structure of a major portion of the Valley and Ridge in Georgia, named and defined the Coosa, Rome, and Cartersville faults in this same area (1891, 1902), and set the stage for numerous subsequent arguments over the position of the Cartersville fault by moving the trace eastward from his original interpretation (Hayes, 1901). Although much of Hayes' work was modified later, the primary contributions of this exceptional pioneer in Georgia geology still remain intact. At about the same time as Hayes was publishing iron ore deposits (Haseltine, 1924), and aluminosilicate deposits (Prindle, 1935; Furcron and Teague, 1945).

In the years between 1945 and 1966, only two reports on the northern Piedmont were published: Crickmay's (1952) *Geology of the crystalline rocks of Georgia* and Hurst's (1955) geologic map of the Kennesaw Mountain-Sweat Mountain area. In his report, Crickmay coined the belt terminology for Georgia and included what in this report is termed northern Piedmont in his Wedowee-Ashland and Tallulah belts.

Publications relating to the geology of the northern Piedmont picked up again in the late 1960's with Higgins' (1966) report and map (Higgins, 1968) on the Brevard zone. In these publications, Higgins outlined the general stratigraphy north of the Brevard fault zone near Atlanta and introduced the term Sandy Springs Sequence, which was subsequently revised to the Sandy Springs Group by Higgins and McConnell (1978a, 1978b). In the early 1970's Hurst published two regional studies (1970, 1973) on crystalline rocks in Georgia. In the latter of these, Hurst (1973) used the term "Blue Ridge" for what in this report is referred to as northern Piedmont. In addition, Hurst (1973), using terms originally introduced in Alabama by Adams (1926), defined the Ashland Group and Wedowee Formation in Georgia. These terms, derived from rock units described in Alabama, were used to define rocks in the southwestern part of the northern Piedmont. The use of these terms and their applicability are discussed in detail in a later section.

Hurst and Crawford (1970) published a report on the sulfide deposits of the Coosa Valley area which included geochemical maps as well as reconnaissance mapping in Paulding and Haralson Counties and descriptions of cores from various sources. Similar compilations were published by Long (1971) and Hurst and Long (1971) for the Chattahoochee-Flint area. Crawford and Medlin (1970, 1971, 1973, 1974) and Medlin and Crawford (1973) described the stratigraphy and structure of the northern Piedmont in west-central Georgia. These reports presented interpretations regarding the stratigraphy and structure of the area between the Cartersville and Brevard fault zones. Additional publications from the mid-to-early 1970's are: the petrology and geochemistry of some of the felsic gneisses in west Georgia (Coleman and others, 1973; Bearden, 1976; Sanders, 1977); origin and strontium isotope composition of amphibolites in the Cartersville to Villa Rica area (Hurst and Jones, 1973; Jones and others, 1973); a geologic map of Forsyth and parts of Fulton Counties (Murray, 1973); open-file maps of an area along the northwestern border of the northern Piedmont (Crawford, 1976, 1977a, 1977b); and K-Ar dates of rocks on either side of the Brevard zone (Stonebraker, 1973).

In the late 1970's there was a revival of interest in publications regarding economic minerals and their occurrences. Cook (1978b, 1978c) reported on soil geochemistry in the area of the Franklin-Creighton gold mine and on several other massive sulfide deposits in western Georgia. Somewhat later Abrams and others (1981), Abrams and McConnell (1981a, 1982a, 1982b, 1982c) and McConnell and Abrams (1982b, 1983) interpreted the massive sulfide and gold deposits in west Georgia to be volcanogenic in origin and showed the genetic and geographic relationship between banded iron formation and most of the major massive sulfide and gold deposits in west Georgia.

During the late 1970's and early 1980's the results of studies on stratigraphic and structural problems in the northern Piedmont on both local and regional scales were published. Higgins and McConnell (1978a; 1978b) revised and formalized the terminology of the Sandy Springs Group; Kline (1980, 1981) indicated that rocks of the Sandy Springs Group are present south of the Brevard fault zone; McConnell (1980a) described a metabasaltic unit with back-arc basin affinities (i.e., Pumpkinvine Creek Formation) on the northwestern border of the northern Piedmont; and Abrams and McConnell (1981a, 1981b) and McConnell and Abrams (1978) revised the stratigraphy and structural interpretations in the Austell-Villa Rica area emphasizing the influence of multiple deformation in this area. Two regional studies were completed in this period. McConnell and Costello (1980b) led a field trip across the northern Piedmont and southwestern Blue Ridge and defined the major rock units and structural features in those two areas, and McConnell and Abrams (1982a) compiled the available data for the northern Piedmont onto one map.

SOUTHERN PIEDMONT AND BREVARD FAULT ZONE

The term southern Piedmont, as used in this report, consists of rocks southeast of the Brevard fault zone. This usage would include parts of King's (1955) Inner Piedmont belt and Crickmay's (1952) Dadeville belt.

As with all of the aforementioned geographic areas, some of the earliest work performed in the southern Piedmont was published in the form of bulletins describing economic mineral occurrences. Economic minerals and rocks that were discussed in this area include corundum (King, 1894); gold (Yeates and others, 1896; Jones, 1909); asbestos, soapstone and talc deposits (Hopkins, 1914); granites and gneisses (Watson, 1902); kyanite and vermiculite (Prindle, 1935); sillimanite and kyanite (Furcron and Teague, 1945); and pyrite deposits (Shearer and Hull, 1918).

The first significant study of the geology of the southern Piedmont outside of economic reports was that done by Crickmay (1952) in his study of the crystalline rocks in Georgia. Crickmay (1952) termed rocks of the Brevard fault zone the Brevard belt and rocks southeast of the Brevard the Dadeville belt. Two observations in Crickmay's report are interesting in light of the current ideas regarding the nature of the Brevard fault zone. Crickmay commented on the "button" schist, suggesting that it resulted from the formation of a second cleavage, and also noted that rocks of the Dadeville belt were "essentially a repetition of the rocks of the Tallulah belt . . ." (i.e., northern Piedmont) (Crickmay, 1952, p. 6).

Following the work of Crickmay, interest turned to the major post-metamorphic granite intrusives which are so prominent in the Piedmont southeast of the Brevard zone. Herrmann (1954) provided the first detailed mapping in the southern Piedmont in the Stone Mountain-Lithonia district. Herrmann (1954) described in detail the structure and petrography in this area as well as the aggregate industry that had developed. Beginning in 1957, a series of abstracts and articles was published regarding the age of some of the aforementioned granite intrusives. Pinson and others (1957) reported ages of approximately 280 m.y. for the Stone Mountain Granite, 290 m.y. for the Lithonia Gneiss, and 340 m.y. for the Ben Hill Granite. Subsequent publications by Pinson and others (1957a, 1958) and Grunenfelder and Silver

Map. Crickmay (1936) indicated that the Talladega Series, originally defined in Alabama, extends across western Georgia to near Cartersville and then turns northward toward North Carolina and Tennessee. In that interpretation rocks of the Murphy belt group and parts of the Ocoee Supergroup were considered part of the Talladega series. With the publication of Crickmay's report, the controversy over the Cartersville fault problem began in earnest. In 1950, Kesler indicated that the Cartersville fault did not exist east of Cartersville and that the Corbin Gneiss was a "static emplacement." Rocks overlying the Corbin were included in the Lower Cambrian Valley and Ridge sequence and amphibolites south of the Allatoona fault were considered to be para-amphibolites (i.e., metamorphosed Rome shale) Kesler (1950).

In 1964, Sever published a report on the geology and ground water in Dawson County in the extreme northeastern part of the study area, and Fairley (1965) revised the work of Bayley (1928) in the Tate Quadrangle. Smith and others (1969) published a listing of previous and new isotopic age dates and an isograd map of Georgia which included the Blue Ridge. Shortly before Smith and others' (1969) report, the Cartersville fault problem was addressed at the annual meeting of the Georgia Geological Society (Bentley and others, 1966). Bentley and others (1966) extended the Cartersville fault southward to near Bolivar, but questioned its existence east of Cartersville. They reassigned rocks defined by Hayes as Ocoee to the Weisner Formation of the Chilhowee Group (Bentley and others, 1966).

In 1970, Crawford and Medlin suggested that graphitic phyllites of the Talladega belt were equivalent to those in the Sandy Springs Group and Cressler (1970) described parts of the Talladega belt in his study of the geology and hydrology of Polk County. Hurst (1970, 1973) published regional reports that included what is here termed "Blue Ridge." Hurst (1970) outlined metamorphic isograds and indicated that the Cartersville fault was present east of Cartersville. Hurst (1973) interpreted the Cartersville fault to be absent east of Cartersville and equated rocks overlying the Corbin Gneiss with the Weisner Formation and Shady Dolomite. Crawford and Medlin (1973) suggested that Talladega belt rocks are equivalent to rocks exposed in the Austell-Frolona antiform to the southeast; Fairley (1973) equated members of the Murphy belt group with rocks south of the Allatoona fault (i.e., New Georgia Group of this report); and Power and Forrest (1973, p. 698) described the stratigraphy and paleogeography of the Murphy belt group suggesting it represented an "ancient transgressive linear shoreline."

During 1973, information regarding relative ages of rocks in the Blue Ridge also was published. McLaughlin and Hathaway (1973) described the occurrence of fossils in the Murphy Marble that suggested an early Paleozoic age for the marble, but Chapman and Klatt (1983) cast doubt on this interpretation by showing that fossils associated with the Murphy marble are within Quaternary sinkhole deposits. Odom and others (1973) reported a Pb-Pb age of 1000 m.y. from zircons extracted from the Corbin Gneiss. Dallmeyer (1975) confirmed a Grenville or Proterozoic Y age for the Corbin Gneiss using $^{40}Ar/^{39}Ar$ techniques.

Since 1973, published work on Blue Ridge geology was related primarily to problems of the Cartersville fault east of Cartersville and the stratigraphy and structure of the rocks southeast of Emerson (Plate I). Crawford (1976, 1977a, 1977b), in several open-file maps, outlined the lithologic characteristics of the northeastern portion of the Talladega belt. Crawford's interpretation of the western portion of the Cartersville fault was reported in the Georgia Geological Society guidebook prepared by Chowns (1977). Crickmay (1933) and Costello (1978) reported on ductile shear zones in the Corbin Gneiss; O'Connor and others (1978) reported on the stratigraphy and structure of the Salem Church anticlinorium; and McConnell and Costello (1979) indicated that large-scale crustal shortening had occurred in the southwestern Blue Ridge. Cressler and others (1979) and Crawford and Cressler (1981, 1982) suggested that the Talladega "Group" and associated lithologies overthrust the Great Smoky fault (an extension of the Cartersville fault in this report) and the southwestern terminus of the Salem Church anticlinorium along a low-angle fault termed the "Emerson (Cartersville) fault." McConnell and Costello (1980b, 1982a) disputed this interpretation and suggested that rock units of the Talladega belt bend around the Emerson reentrant in the Cartersville-Great Smoky fault (Cartersville fault in this report) and merge with rocks of the Ocoee Supergroup. McConnell and Costello (1980b) and Costello and McConnell (1980) outlined the basic stratigraphy of rocks nonconformably overlying the Corbin Gneiss equating them to the Ocoee Supergroup. Some of these units were later formalized (McConnell and Costello, 1984).

Other recent publications on the geology of the Blue Ridge include "Economic geology of the Georgia Marble District" (Power, 1978), a report on uranium in graphitic phyllites in this area (McConnell and Costello, 1980a), and an abstract on recumbent folding in rocks nonconformably overlying the Corbin Gneiss (Costello and McConnell, 1981). In 1982, a preliminary compilation of the geology in the Greater Atlanta Regional Map area was published (McConnell and Abrams, 1982a).

NORTHERN PIEDMONT

The term northern Piedmont as used in this report includes those rocks northwest of the Brevard fault zone and southeast of the Allatoona fault. Although the problem of regional "belt" terminology was discussed in a previous section, it can be said here that rocks and stratigraphic successions of the northern Piedmont strongly resemble those south of the Brevard fault zone and differ from Ocoee Supergroup, Murphy belt group and Talladega "Group" rocks north of the Allatoona fault. These relationships as well as the fact that the area between the Brevard and Allatoona faults is physiographically Piedmont are the factors related to terming this area northern Piedmont.

Previous works on the geology of the northern Piedmont are bimodally split with regard to time. During the late 1800's and early 1900's, bulletins published by the Geological Survey of Georgia dealt with many economic minerals known to occur in the northern Piedmont. Early publications relating to economic mineral and rock occurrences present in the northern Piedmont include reports on corundum deposits (King, 1894), gold deposits (Yeates and others, 1896; Jones, 1909), granites and gneisses (Watson, 1902), manganese (Watson, 1908), asbestos, talc and soapstone (Hopkins, 1914), pyrite deposits (Shearer and Hull, 1918), manganese (Hull and others, 1919),

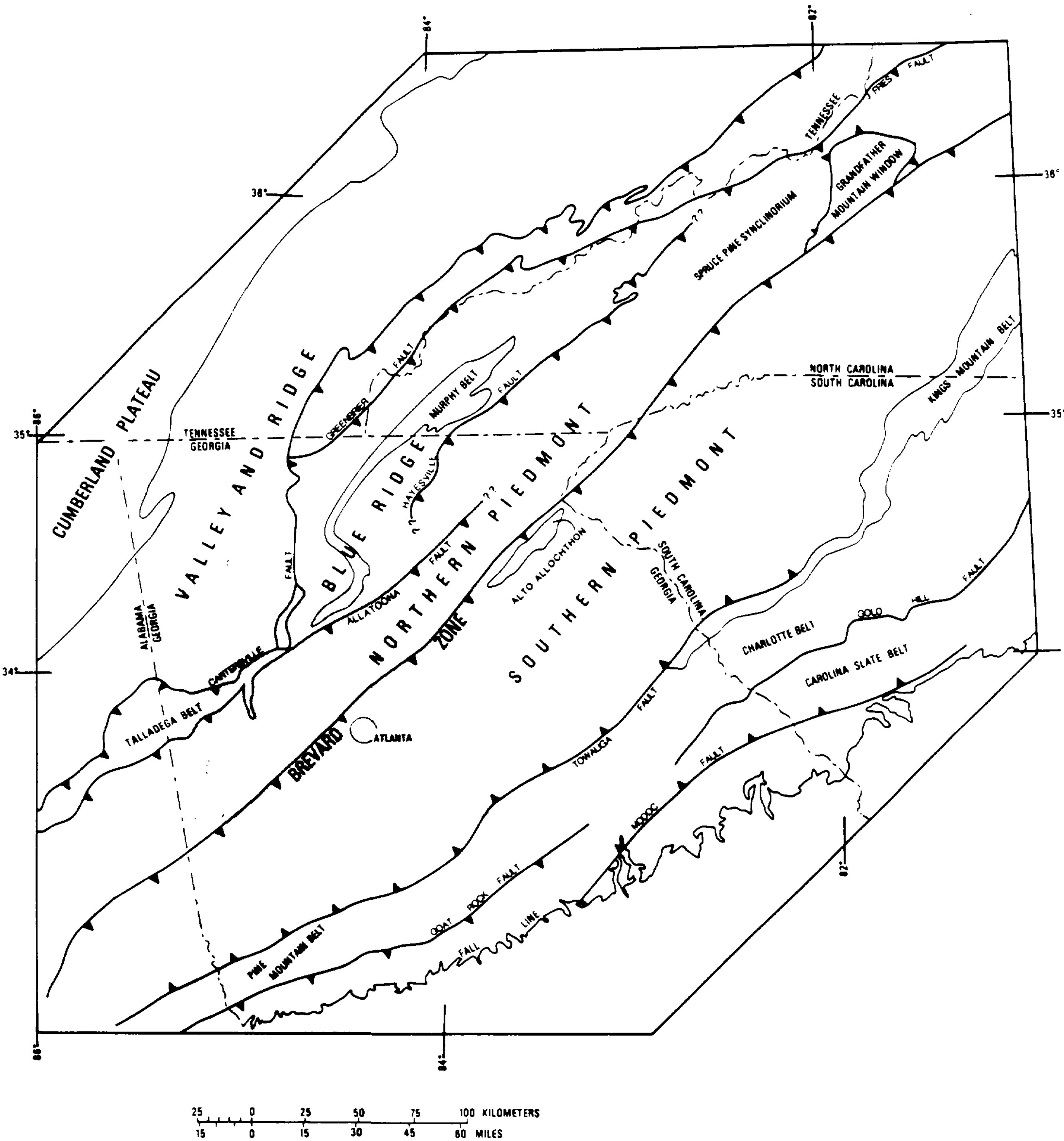


Figure 2. Regional location map showing boundaries of the Greater Atlanta Regional Map and regional setting of map area (modified after McConnell and Costello, 1982).

(1958) redefined the ages for the previously mentioned rock units and gave an age of approximately 295 m.y. for the Panola Granite. Interest in the age of these post-metamorphic intrusive rocks continued into the 1960's, 1970's and 1980's as the methodology of isotopic dating improved and the precision of the age determinations was refined. Although the exact ages for these intrusive bodies varied, the succeeding reports (i.e., Long and others, 1959; Whitney and others, 1976; Dallmeyer, 1978; Atkins and Higgins, 1980; Higgins and Atkins, 1981) essentially confirmed late Paleozoic ages for the post-metamorphic intrusive rocks. The results of investigations into the timing of metamorphism were being reported at the same time as ages for post-metamorphic intrusives. Initial K-Ar work on schists and gneisses in the southern Piedmont by Pinson and others (1957), Kulp and Eckelmann (1961) and Long and others (1959) indicated ages from approximately 350 m.y. to 250 m.y. with a distinct "younging" trend to the southeast from Atlanta. Kulp and Eckelmann (1961) suggested that these ages indicated two periods of regional metamorphism; one at approximately 350 m.y. and the second near 250 m.y. ago. Using the above ages, Hurst (1970) coined the term "hot belt" for the area containing the younger ages. Stonebraker (1973) provided additional K-Ar analyses on samples from traverses across the Brevard zone near Atlanta. Finally, Dallmeyer (1975) indicated that $^{40}Ar/^{39}Ar$ ages suggested that the younger age-dates obtained by K-Ar methods are the result of differences in cooling and uplift rates. He suggested an age of 365 m.y. for peak metamorphism of the region described here as southern Piedmont (Dallmeyer, 1975).

Outside of isotopic dating efforts, geologic interest in the southern Piedmont during the late 1950's and 1960's was concentrated around the Stone Mountain Granite. Reports regarding mineralogical variation (Wright, 1966), weathering (Grant, 1963), and intrusion mechanics (Grant, 1969) of the Stone Mountain Granite were published during this time period. Grant (1962) also led a field trip into the Stone Mountain-Lithonia district. The 1970's and early 1980's saw a continuation of geologic interest in the Stone Mountain Granite. Reports on the origin (Whitney and others, 1976) and geochemistry (Atkins and others, 1980b) of the Stone Mountain Granite as well as another field trip guidebook for the area (Grant and others, 1980) were published.

After a gap of over a decade, publication on the stratigraphy and structure of the southern Piedmont resumed in the mid-1960's with the publications on the Brevard zone by Higgins (1966, 1968). In the recent past, reports regarding the various aspects of stratigraphy and structure were published (i.e., Atkins and Higgins, 1978, 1980; Atkins and others, 1980a; Higgins and others, 1980a, 1980b; Higgins and Atkins, 1981; Kline, 1980, 1981).

Much of the preceding geologic information from all of the aforementioned geographic areas was included in the compilation of the 1976 State Geologic Map of Georgia. This map also included unpublished reconnaissance mapping by various geologists (Georgia Geologic Survey, 1976).

STRATIGRAPHY

Introduction

Detailed and reconnaissance geologic mapping has formed the basis on which stratigraphic successions for the Blue Ridge, northern Piedmont and southern Piedmont were developed. Much of this mapping expanded upon earlier reconnaissance mapping by many authors.

In the Blue Ridge, the proposed stratigraphic terminology and correlations are, to some degree, a return to those of C.W. Hayes (1895) in his unpublished report on the Cartersville 30-minute sheet. Although written nearly 100 years ago, Hayes' report on the Cartersville area, particularly the stratigraphic correlations and his interpretation of the relationship between the Corbin Gneiss Complex and its cover rocks, is consistent with our interpretations.

South of the Allatoona fault and north of the Brevard zone, imprecise and over-extended terms such as Ashland and Wedowee are abandoned in favor of two major groups (i.e., New Georgia and Sandy Springs Groups) that are distinguished on the basis of lithology, protolith, and depositional environment. Resolution of a recognizable stratigraphy in the northern Piedmont also has led to the recognition of stratigraphic indicators for massive sulfide and gold deposits (Abrams and McConnell, 1982a).

Southeast of the Brevard fault zone, Higgins and Atkins (1981) defined the Atlanta Group. In this report, we use units defined by Higgins and Atkins, but reinterpret the structural setting, redefining the major structural feature, the Newnan-Tucker synform, as a synformal anticline rather than a synformal syncline as originally proposed (Higgins and Atkins, 1981). The stratigraphic succession used in the Valley and Ridge is after Cressler (1970) and Cressler and others (1979), which were modified from Hayes (1902) and Butts and Gildersleeve (1948).

The following discussion describes in detail only those rock units that are in areas which have undergone substantial revision during this investigation. In this report capitalization of previously defined stratigraphic units follows the original author's usage unless otherwise defined in this text. For a description of all stratigraphic units within the Greater Atlanta Regional area see Appendix A of this report.

Stratigraphy of the Valley and Ridge

Rocks ranging in age from Lower Cambrian(?) to Pennsylvanian are present in the Valley and Ridge portion of the Greater Atlanta Regional Map. Our work in the Valley and Ridge portion of the Greater Atlanta Region was directed at an area in the immediate vicinity of Cartersville (Fig. 2). For this reason we have limited our discussion of Valley and Ridge stratigraphy to rocks in that area. This means that only Lower Cambrian rocks (Chilhowee through Rome Formations) are discussed. The reader is referred to Appendix A for detailed descriptions of the Middle Cambrian through Pennsylvanian section in this area.

Overlying the Chilhowee Group is the Shady Dolomite. The boundaries of the Shady Dolomite in the Cartersville area are subject to some disagreement (Table 1). Kesler (1950) and Reade and others (1980) believe that the Shady Dolomite should be restricted to a basal, thin, black or dark-gray, fine-grained dolostone having paper-thin shale lamellae. In their interpretation, Reade and others (1980) place the overlying gray dolostone and interlayered dolostone and shale in the Rome Formation. In contrast, Cressler and others (1979) place all of the dolostones above the Chilhowee and below the Rome shales in the Shady Dolomite. Archaeocyathids were found in both the lower dark-gray unit and upper light-gray unit (Stan Bearden, personal commun., October, 1982). Costello and others (1982) note that the light-gray dolostones interfinger with shales that generally are assigned to the Rome Formation and indicate that they are time equivalents of the Rome Formation. This report follows the definition of the Shady Dolomite as reported by Cressler and others (1979) (Table 1).

The Rome Formation is composed of fine-grained, slightly calcareous, green to red sandstone (Butts and Gildersleeve, 1948). Sandstone is interlayered with greenish shale that weathers to a gray, pinkish or yellowish shale. Thin layers of limestone also are present.

Stratigraphy of the Blue Ridge

The Blue Ridge portion of the Greater Atlanta Regional Map is dominated by two major structural features which lie adjacent to each other (Fig. 3), the Salem Church anticlinorium and Murphy synclinorium. The determination of a stratigraphic succession in these two structures is complicated by 1) lack of continuous exposures, 2) multiple fold events, 3) both brittle and ductile faulting, 4) sedimentary facies changes, and 5) internal unconformities. The combination of the five above-mentioned factors has resulted in numerous, often conflicting, interpretations regarding the stratigraphic sequence. Generally, interpretations of the stratigraphic sequence in this area were dependent on whether or not the Corbin Gneiss Complex was considered as intrusive into the Blue Ridge sequence and if the Cartersville fault was interpreted to be present east of Cartersville. A brief summary of the various interpretations was presented in the Previous Works section of this report and will not be repeated here, but investigations related to this report (McConnell and Costello, 1980b, 1982a) have shown that Hayes' original work in the area, with minor modifications, is correct. Hayes' observations regarding the presence of a nonconformity between the

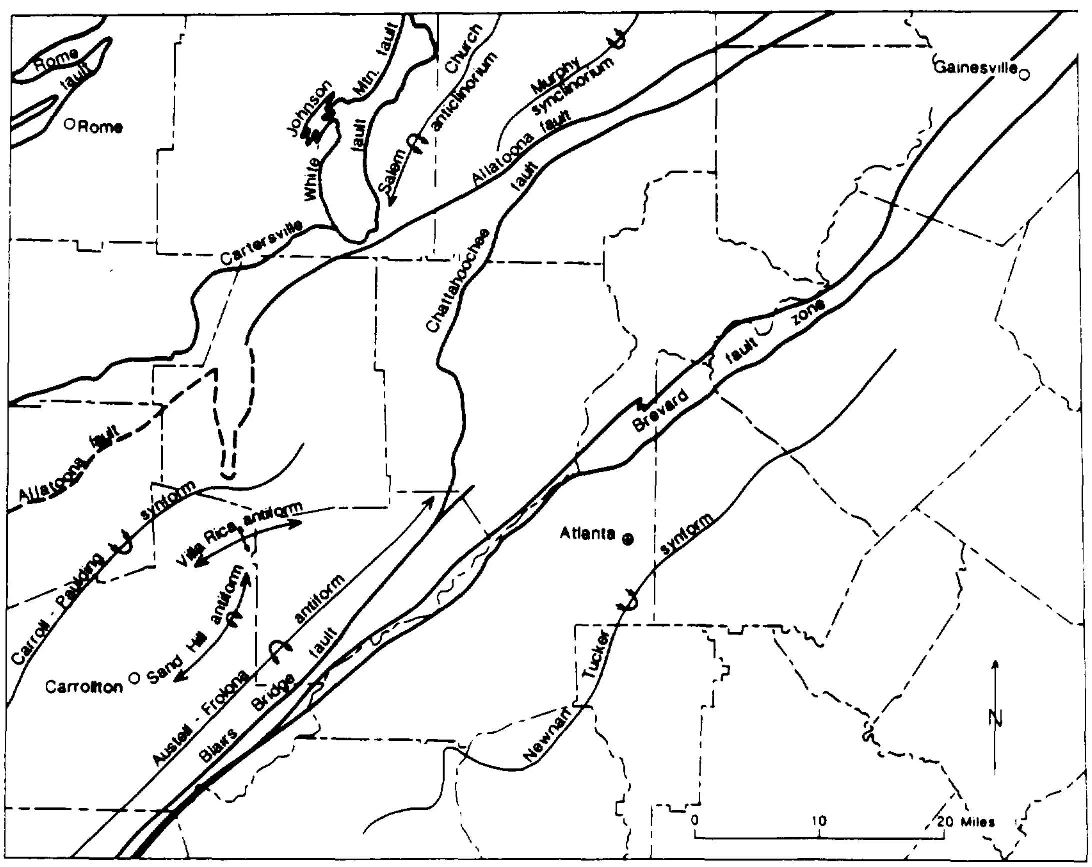


Figure 3. Major structural features of the Greater Atlanta Regional Map.

Chilhowee Group rocks are the oldest rocks present in the Valley and Ridge. The base of the Chilhowee is not exposed in this area because the Chilhowee occurs as the oldest unit in a series of imbricate thrust sheets along the trace of the Cartersville fault. Mack (1980) divided the Chilhowee Group in Georgia and Alabama into four formations, i.e., Cochran, Nichols, Wilson Ridge and Weisner Formations (Table 1). Of these, only the two uppermost units (i.e., Wilson Ridge and Weisner) are known to be present in the Greater Atlanta Region. Mack (1980) formalized the Wilson Ridge Formation and described it as fine- to coarse-grained, moderately well-sorted orthoquartzite. Overlying the Wilson Ridge Formation is the Weisner Formation (Mack, 1980). The Weisner is composed of very fine- to fine-grained orthoquartzite, varying to cross-bedded fine- to coarse-grained orthoquartzite, conglomerate, and greenish-gray mudstone (Mack, 1980). In light of the controversy over the existence of the Cartersville fault in the vicinity of Cartersville and the equivalence of the Pinelog Formation and Chilhowee Group, it is interesting to note the lithologic differences between the two units. Mack (1980) suggested that the Wilson Ridge Formation was deposited in a nearshore, high-energy environment and the Weisner Formation was deposited in a beach or barrier-island environment. This differs sharply from the characteristics of the Pinelog Formation east of the Cartersville fault where the Pinelog consists of locally, poorly sorted, graded conglomerates, diamictites, and black shales (graphitic phyllites) interlayered with fine- to medium-grained quartzites. These lithologies and textures in the Pinelog Formation are indicative, at least in part, of a high-energy deep-water environment in a rapidly subsiding basin. Previous attempts to equate the Pinelog with the Chilhowee and to deny the existence of the Cartersville fault are discussed in the Blue Ridge section.

Table 1. Stratigraphic successions in the Valley and Ridge. Capitalization of units follows original author's usage.

Hayes, 1902	Butts and Gildersleeve, 1948	Kesler, 1950	Cressler, 1970; and Cressler and others, 1979		Mack, 1980	This Report (after Cressler, 1970; and Cressler and others, 1979)	
Lookout sandstone	Pottsville formation	NOT DEFINED	Pennsylvanian (undivided)		NOT DEFINED	Pennsylvanian (undivided)	Pennsylvanian
Bangor limestone	"Bangor" limestone		Bangor Limestone			Bangor Limestone	Mississippian
Oxmoor sandstone	Floyd shale Rockmart slate		Hartselle Sandstone Member			Hartselle Sandstone Member	
Floyd shale			Floyd Shale			Floyd Shale	
Fort Payne chert	Fort Payne chert		Fort Payne Chert Lavender Shale Member	Fort Payne Chert Lavender Shale Member		Fort Payne Chert (Includes Lavender Shale Member)	
Chattanooga shale	Chattanooga shale		Armuchee Chert			Armuchee Chert	Devonian
Frog Mountain sandstone / Armuchee chert	Armuchee chert						
Rockwood formation	Red Mountain formation / Sequatchie formation		Red Mountain Formation			Red Mountain Formation	Silurian
Rockmart slate	Maysville limestone, Trenton limestone, Lowville limestone, Ottosee shale, Tellico formation, Athens shale, Holston marble, Lebanon limestone, Lenoir limestone, Mosheim limestone, Murfreesboro limestone, Newala limestone		Upper and Middle Ordovician (undivided)	Rockmart Slate		Upper and Middle Ordovician (undivided)	Ordovician
Chickamauga limestone				Lenoir Limestone		Rockmart Slate	
			Newala Limestone			Newala Limestone	
Knox dolomite	Knox dolomite		Knox Group			Knox Group	
Conasauga formation	Conasauga shale	Conasauga formation	Conasauga Formation			Conasauga Group	Cambrian
Rome formation	Rome formation	Rome formation	Rome Formation			Rome Formation	
Beaver limestone	Shady dolomite	Shady dolomite	Shady Dolomite			Shady Dolomite	
Weisner quartzite	Weisner quartzite	Weisner formation	Chilhowee Group		Weisner Formation / Wilson Ridge Formation / Nichols Formation / Cochran Formation	Chilhowee Group	

ag	**Austell Gneiss** (Abrams and McConnell, 1981a; Abrams, 1983): fine- to coarse-grained blastoporphyritic to nonporphyritic orthogneiss composed of muscovite, biotite, oligoclase, quartz and microcline.
shg	**Sand Hill Gneiss** (this report): fine- to coarse-grained blastoporphyritic to nonporphyritic orthogneiss composed of muscovite, biotite, oligoclase, quartz and microcline. Generally contains more muscovite, quartz and plagioclase and less microcline than Austell Gneiss.
mrg	**Mulberry Rock Gneiss** (this report): medium-grained, equigranular muscovite-quartz-microcline-plagioclase orthogneiss.
d	**Diabase dikes**

SOUTHERN PIEDMONT PROVINCE AND BREVARD FAULT ZONE

Atlanta Group (late Precambrian to early Paleozoic)
(stratigraphic order revised after Higgins and Atkins, 1981):

cc	**Camp Creek Formation** (Higgins and Atkins, 1981): massive granite gneiss interlayered with thin, fine-grained, dark-green hornblende-plagioclase amphibolite.
icq	**Intrenchment Creek Quartzite** (Higgins and Atkins, 1981): spessartine quartzite and spessartine-mica schist interpreted in this report to be banded iron formation.
bci	**Big Cotton Indian Formation** (Higgins and Atkins, 1981): intercalated biotite-plagioclase gneiss (locally porphyritic), hornblende-plagioclase amphibolite, and biotite-muscovite schist.
ca tc f	**Clarkston Formation** (Higgins and Atkins, 1981): sillimanite-garnet-quartz-plagioclase-biotite-muscovite schist interlayered with hornblende-plagioclase amphibolite (ca). Includes a unit composed only of schist termed the Fairburn Member (f); and a unit similar to Clarkston undifferentiated termed the Tar Creek Member (tc).
st	**Stonewall Formation** (Higgins and Atkins, 1981): intercalated fine-grained biotite gneiss, hornblende-plagioclase amphibolite and sillimanite-biotite schist.
wac	**Wahoo Creek Formation** (Higgins and Atkins, 1981): includes slabby, medium-grained muscovite-plagioclase-quartz gneiss, amphibolite, mica schist and epidote-calcite-diopside gneiss (calc-silicate).
se	**Senoia Formation** (Atkins and Higgins, 1981): garnet-biotite-muscovite schist interlayered with fine-grained amphibolite, local thin layers of spessartine quartzite (iron formation?), sillimanite schist and biotite gneiss.
cl	**Clairmont Formation** (Higgins and Atkins, 1981): interlayered medium-grained biotite-plagioclase gneiss and fine- to medium-grained hornblende-plagioclase amphibolite.
pl h	**Promised Land Formation** (Higgins and Atkins, 1981): includes massive to thinly layered, medium-grained, gray, banded biotite granite gneiss interlayered with fine-grained, dark-green to greenish black, blocky amphibolite. A thin quartzite and muscovite quartz schist unit near top of the Promised Land Formation is termed the Hannah Member (h).
wc	**Wolf Creek Formation** (Higgins and Atkins, 1981): thinly laminated, fine-grained amphibolite interlayered with lustrous, silvery, gray, biotite-muscovite schist.

Sandy Springs Group (late Precambrian to early Paleozoic): includes an eastern and western belt.

Western belt:

dru drs dra bif	**Dog River Formation** (this report: includes undifferentiated muscovite-biotite-quartz-feldspar gneiss (metagraywacke), garnet-muscovite schist, and amphibolite (dru), with mappable units of garnet-muscovite schist (drs), amphibolite (dra) and thin (1 to 3 in.) layers of banded iron formation (bif).
amu amq	**Andy Mountain Formation** (Crawford and Medlin, 1974; Abrams and McConnell, 1981a): biotite-garnet-plagioclase-muscovite-quartz schist ± graphite, staurolite, and kyanite, and feldspathic, micaceous garnet quartzite of the Andy Mountain Formation undifferentiated (amu); and clean, sugary quartzite ± garnet (amq).
ba	**Bill Arp Formation** (Crawford and Medlin, 1974; Abrams and McConnell, 1981a): interlayered garnet-biotite-muscovite-plagioclase-quartz schist; muscovite schist; quartz-muscovite-biotite schist; muscovite-biotite-quartz-plagioclase schist; and metagraywacke (ba). Locally calcareous concretions, possibly limey lenses, occur as elongate features parallel to foliation.

Eastern belt:

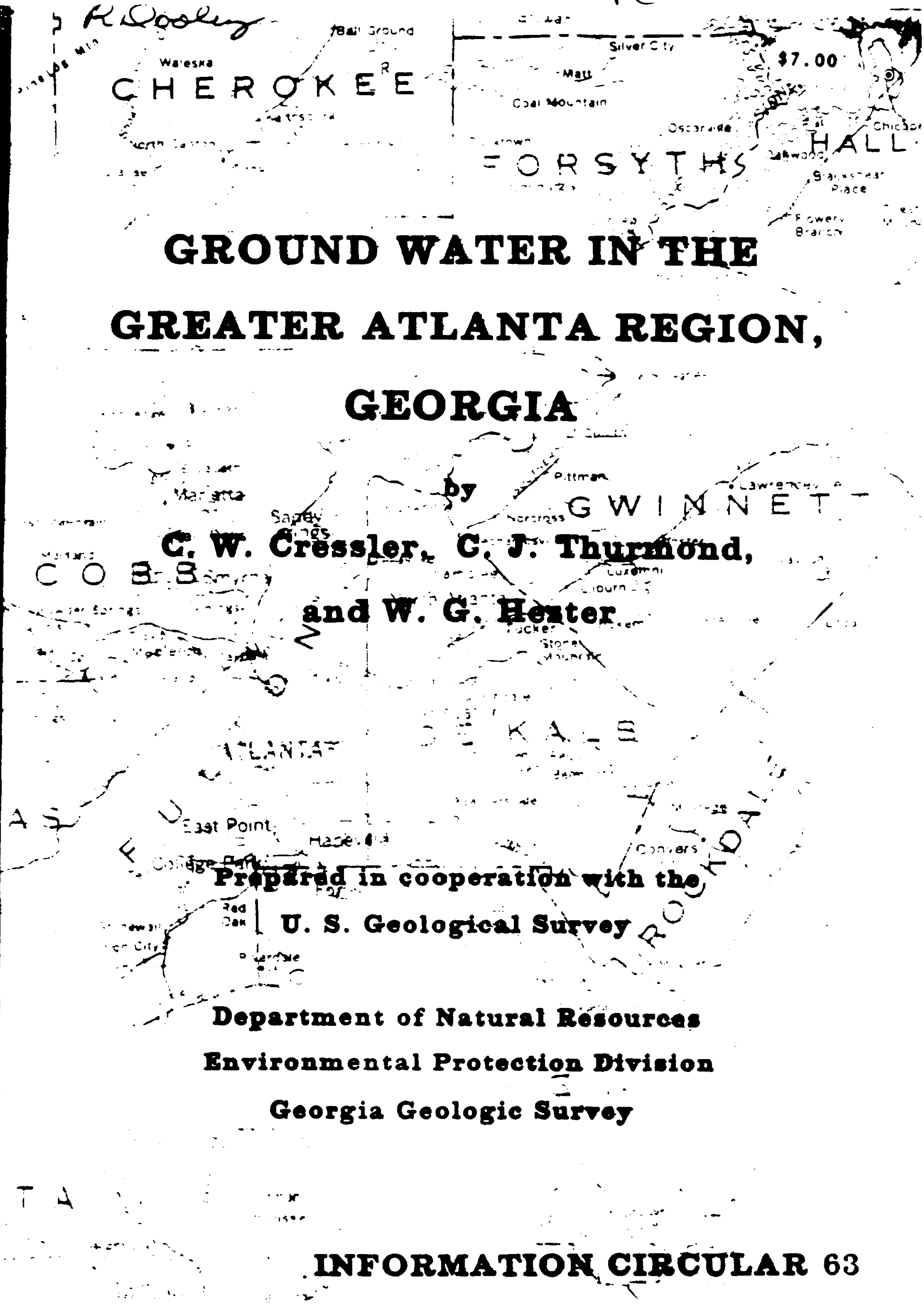
pfu pfs bif ma	**Powers Ferry Formation** (Higgins and McConnell, 1978a; this report): undifferentiated biotite-quartz-plagioclase gneiss (metagraywacke), mica schist and amphibolite (pfu); a mappable mica schist unit (pfs); and banded iron formation (bif). One continuous amphibolite was termed the Mableton amphibolite (ma).
cpq	**Chattahoochee Palisades Quartzite** (Higgins and McConnell, 1978a; this report): massive, white, yellowish, or bluish, sugary to vitreous quartzite locally containing accessory mica, feldspar, and elongate garnets (cpq). Graded bedding is apparent locally.
fs	**Factory Shoals Formation** (Higgins and McConnell, 1978a): intercalated light-gray, lustrous, garnet-biotite-oligoclase or muscovite-biotite-plagioclase metagraywacke, kyanite-quartz schist, and staurolite-muscovite quartz schist (fs). Locally, schist grades to a garnet-graphite schist.
cs bif kq ss gms bgms gs amp/hgn ggn um	**Unnamed Rock Units**: includes chlorite schist and chlorite-anthophyllite schist interpreted to represent relict magnesium-aluminum hydrothermal alteration zone (cs); sulfide, magnetite or manganese-bearing quartzites interpreted as banded iron formation (bif); coarse-grained kyanite-quartz granofels interpreted to represent relict aluminosilicate hydrothermal alteration zones (kq); interlayered sericite schist and micaceous quartzite (ss); garnet-muscovite schist (gms); biotite-garnet-muscovite schist (bgms); amphibolite and hornblende gneiss (amp/hgn); blastoporphyritic to nonporphyritic biotite muscovite-quartz-plagioclase-microcline gneiss (ggn), and meta-ultramafic rock (um).
llu lld llg	**Laura Lake Mafic Complex** (McConnell and Costello, 1980b; this report): migmatitic garnet amphibolite of the Laura Lake Mafic Complex undifferentiated llu) with smaller amounts of pyroxene (relict)-bearing metagabbro (llg), meta-quartz diorite (lld), meta-ultramafic rock and banded iron formation. Magnetite occurs as common porphyroblasts in amphibolite and coarse-grained amphibole-quartz-plagioclase rock is common neosome.

iy	**Inman Yard Formation** (Higgins and Atkins, 1981): porphyroblastic biotite-plagioclase gneiss porphyroblastic granite gneiss and sillimanite-muscovite schist.
ng	**Norcross Gneiss** (Higgins and Atkins, 1981): light-gray epidote-biotite-muscovite-plagioclase gneiss locally containing amphibolite.
n l	**Snellville Formation** (Higgins and Atkins, 1981): includes two members, a lower member of interlayered garnet-biotite-muscovite schist, biotite-muscovite schist, thin amphibolites and minor biotite gneiss and quartzite termed the Norris Lake Schist (n) and an upper member composed of quartzite variably containing muscovite, garnet and sillimanite termed the Lanier Mountain Quartzite (l).
pfu cpq fs	**Sandy Springs Group** (Higgins and McConnell, 1978a; Kline, 1980; this report): Similar to sequence observed in northern Piedmont and at least partially equivalent to Atlanta Group (see text). Includes a lower unit of intercalated biotite gneiss, mica schist and amphibolite (pfu); a middle unit composed of micaceous quartzite, mica schist and graphitic schist (cpq); and an upper unit of graphite-garnet-mica schist with lesser amounts of biotite gneiss and amphibolite (fs).
um amp bgn ggn sg bgn/amp/sch q bms m	**Unnamed or unassigned units** (after Grant, unpublished data; this report): includes meta-ultramafic rocks (um); amphibolite (amp); mica schist and biotite gneiss (bgn); granitic gneiss (ggn); interlayered sillimanite-graphite schist and graphitic, feldspathic quartzite (sg); graphitic, micaceous, feldspathic quartzite (q); intercalated biotite gneiss, amphibolite and mica schist (bgn/amp/sch); garnet-mica schist ± staurolite and garnet-biotite gneiss (bms); and marble (m).
Pzss Pzum Pzsa Pzsas	**Soapstone Ridge Complex** (Higgins and Atkins, 1981): includes an actinolite-chlorite-talc schist (Pzss); fine-grained amphibolite (Pzsa), intermixed amphibolite and actinolite-chlorite-talc schist (Pzsas); and coarse-grained ultramafic rock (Pzum). Also present but not defined on Plate I is a mixed amphibolite-metagabbro-ultramafic unit and a sillimanite-quartz blastomylonite and epidosite near the base of the complex.
lig	**Lithonia Gneiss** (Herrmann, 1954): includes evenly banded biotite-quartz-feldspar gneiss, quartz-rich garnetiferous layers and migmatitic muscovite-biotite-plagioclase-microcline-quartz gneiss termed the Mt. Arabia Migmatite (Grant and others, 1980; not outline on Plate I).
Cp	**Palmetto Granite** (Dooley, *in* Atkins and others, 1980a): coarse-grained porphyritic granite composed of microcline, quartz and plagioclase with accessory biotite, muscovite, perthite, sphene, apatite, epidote, and zircon.
Cb	**Ben Hill Granite** (Higgins and Atkins, 1981): coarse-grained, porphyritic muscovite-biotite quartz-plagioclase-microcline granite.
Cpa	**Panola Granite** (Higgins and Atkins, 1981): homogenous, medium-grained biotite-oligoclase-quartz-microcline granite.
Cs	**Stone Mountain Granite** (Herrmann, 1954): fine- to medium-grained granite composed of biotite, muscovite, microcline, quartz and oligoclase with characteristic rosettes of tourmaline.
my bz bzm	**Ductilely sheared rocks**: includes undifferentiated ductilely sheared rocks in the Brevard zone including button schists (bz), mylonites in the Brevard zone (bzm), and mylonite in other areas (my).
d	**Diabase dikes.**

Reference 15

R Dooley

$7.00



GROUND WATER IN THE GREATER ATLANTA REGION, GEORGIA

by

C. W. Cressler, C. J. Thurmond, and W. G. Hester

Prepared in cooperation with the U. S. Geological Survey

Department of Natural Resources

Environmental Protection Division

Georgia Geologic Survey

INFORMATION CIRCULAR 63

GROUND WATER
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Georgia Department of Natural Resources

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Prepared in cooperation with the

U.S. Geological Survey

Atlanta

1983

INFORMATION
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GROUND WATER IN THE GREATER ATLANTA REGION, GEORGIA

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ABSTRACT

The Greater Atlanta Region encompasses about 6,000 square miles in the Piedmont physiographic province of west-central Georgia. Municipal and industrial water supplies in the area are derived mainly from surface water taken from rivers, streams, and impoundments. Large withdrawals now and predicted for the future are causing concern about surface-water sources being able to meet the rising demands. This study was conducted to assess the availability of ground water in the crystalline rocks of the area, and to devise methods for locating sites for high-yielding wells that could provide alternative sources of supply.

The Greater Atlanta Region is roughly divided in half by the Chattahoochee River, which follows a comparatively straight southwesterly course for nearly 110 miles across the area. Streams in the north half of the area, including the Chattahoochee River basin, mainly have rectangular and trellis drainage styles and clearly show the influence of geologic control. The topography and drainage are closely related to bedrock permeability and conventional methods for locating high-yielding well sites apply to most of the area. In contrast, the south half of the area has a superimposed dendritic drainage style in which streams developed more or less independently of the underlying geology. There, the topography and drainage are poorly related to bedrock permeability; many high-yielding wells occupy ridge crests, steep slopes, and bare-rock areas normally considered to be sites of low yield potential.

To better understand the occurrence of ground water in the area, detailed geologic studies were made of 1,051 high-yielding well sites. The results showed that large well yields are available only where aquifers have localized increases in permeability. This occurs mainly in association with certain structural and stratigraphic features, including: (1) contact zones between rocks of contrasting character and also within multilayered rock units, (2) fault zones, (3) stress relief fractures, (4) zones of fracture concentration, (5) small-scale geologic structures that localize drainage development, (6) folds that produce concentrated jointing, and (7) shear zones. Methods for selecting high-yielding well sites using these structural and stratigraphic features are outlined in the report.

Borehole geophysical techniques were used to study the nature of water-bearing openings. Sonic televiewer logs revealed that in several wells the water-bearing openings consist of horizontal or nearly horizontal fractures 1 to 8 inches in vertical dimension. The fractures were observed in granitic gneiss, biotite gneiss, gneiss interlayered with schist, and in quartz-mica schist. The writers believe the openings are stress relief fractures formed by the upward expansion of the rock column in response to erosional unloading. Core drilling at two well sites confirmed the horizontal nature of the fractures and showed no indication of lateral movement that would associate the openings with faulting.

Wells that derive water from horizontal fractures characteristically remain essentially dry during drilling until they penetrate one or two high-yielding fractures. The fractures are at or near the bottom of the wells. The high-yielding fractures are at or near the bottom of wells because: (1) the lar[illegible]ields were in excess of the desired [illegible]tity and, therefore, drilling cease[illegible] (2) in deep wells yielding 50 to 1[illegible] min or more, the large volume of [illegible] from the fracture(s) "drowned out" [illegible] pneumatic hammers in the drill bi[illegible] effectively preventing deeper dr[illegible]ing. Twenty-five wells in the report [illegible] are known to derive water from bo[illegible]-hole

fractures, all of which are believed to be horizontal stress relief fractures. Other wells in the area are reported to derive water from bottom-hole fractures, which also are believed to be stress relief fractures. These wells occupy a variety of topographic settings, including broad valleys, ridge crests, steep slopes, and bare-rock areas, indicating that stress relief fractures are present beneath uplands and lowlands alike.

Wells deriving water from stress relief fractures have much greater average depths than wells reported from other crystalline rock areas. Many of the wells are 400 to 550 feet or more deep and derive water from a single fracture at the bottom of the hole. In one area, 62 percent of the wells that supply 50 gallons per minute or more are from 400 to more than 600 feet deep. The chance of obtaining large well yields from stress relief fractures is significantly increased by drilling to about 620 feet.

In general, moderate quantities of ground water presently are available in the report area. Most of the 1,165 high-yielding wells that were inventoried during this study supply from 40 to more than 200 gallons per minute. The distribution of these wells with respect to topography and geology indicates that most were located for the convenience of the users and that the large yields resulted mainly from chance, rather than from thoughtful site selection. By employing the site selection methods outlined in this report, it should be possible to develop large supplemental ground-water supplies in most of the area from comparatively few wells.

Coweta, Fayette, Henry, and Clayton Counties in the south part of the area that include the communities of Newnan, Shenandoah, Peachtree City, and Fayetteville are expected to grow rapidly during the next 25 years. Because of unfavorable quality conditions in the Chattahoochee River, these communities and surrounding areas are being forced to turn to small, marginal streams as water-supply sources. These streams are vulnerable to pollution from nonpoint sources and are seriously affected by prolonged drought. For these reasons, the southern Atlanta area is one that can benefit greatly from supplemental ground-water supplies. At present, all of Coweta County outside the city of Newnan uses ground water exclusively, and much of the four-county area soon may require ground water for supplemental or primary sources of supply. Large quantities of ground water are available in the four counties, as indicated by the presence of 168 wells that supply 40 to more than 200 gallons per minute.

Contrary to popular belief, many wells in the Greater Atlanta Region are highly dependable and have records of sustaining large yields for many years. Sixty-six mainly industrial and municipal wells have been in use for periods of 12 to more than 30 years without experiencing declining yields.

Well water in the area generally is of good chemical quality and is suitable for drinking and most other uses. Concentrations of dissolved constituents are fairly consistent throughout the area, and except for iron, rarely exceed drinking water standards.

INTRODUCTION

Municipal and industrial water supplies in the Greater Atlanta Region (GAR) are derived almost exclusively from surface water taken from rivers, streams, and impoundments. Large withdrawals now and predictions for future needs are causing concern about the present metropolitan area systems being able to meet the anticipated demand. Public pressure is mounting against drawing down recreation and power generation reservoirs to obtain additional water. Thus, there is a great need to assess the availability of ground water in the crystalline rocks of the GAR as a possible alternative source of supply for communities and potential industry outside the existing surface systems.

Because of generally low permeability, crystalline rocks have the reputation for furnishing only small quantities of ground water, generally 2 to 30 gal/min, suitable mainly for domestic and farm purposes. As a result, many engineering firms and consultants no longer consider ground water a practical source of supply. This has severely limited the economic development of vast areas not served by municipal or county water systems.

There are, however, a significant number of wells in the GAR that produce 100 to almost 500 gal/min. The fact that most of these wells were located without regard to topography or geology indicates that other high-yielding wells could be developed at numerous selected sites in the GAR. A study was needed that would provide methods for locating wells in the GAR that could be expected to supply large quantities of ground water for supplementing the existing surface-water sources.

This project was part of a long-range plan to appraise the ground-water resources of Georgia, with particular emphasis on high-growth areas. The data collected and used will be entered into the U.S. Geological Survey computer-stored data bank and, along with the published report, will be available to answer information requests and help municipal, industrial, and other planning agencies.

Area of Study

The GAR as used in this report includes an area of about 6,000 mi^2 in west-central Georgia (fig. 1). The study initially was limited to the area covered by the U.S. Geological Survey "Greater Atlanta Region" (1974), 1:100,000-scale topographic map, but later was expanded to include counties along the southern border of the map. As the study is concerned only with metamorphic and igneous rocks of the Piedmont physiographic province, it excludes the northwestern part of the mapped area, which is in the Valley and Ridge physiographic province. All or parts of 27 counties comprise the study area: Barrow, Bartow, Butts, Carroll, Cherokee, Clayton, Cobb, Coweta, Dawson, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall, Haralson, Heard, Henry, Jasper, Newton, Paulding, Pickens, Polk, Rockdale, Spalding, and Walton Counties. The 1980 population of the GAR was about 2,000,000.

Objectives and Scope

The objectives of the study were to assess the quantity and chemical quality of ground water available in the GAR, and to develop methods for locating high-yielding well sites in various geologic and topographic settings throughout the area.

In the GAR, more than 1,165 high-yielding wells (yielding a minimum of 20 gal/min) were inventoried and accurately located on topographic maps by field checking. All of the well sites were analyzed to evaluate the correlation between well yield and topographic setting.

Detailed field studies were conducted on 1,051 well sites to learn the types of geologic and topographic settings that supply large well yields. These studies assessed (1) the local geology and structure of each site to identify the wells that derive water from fault zones, contact zones, and similar features; (2) the relation between topographic setting and geology, to detect sites where the large yields result from a relation of topography to small-scale structures in the rocks; and (3) the relation of the high-yielding wells to the depth and yield of nearby wells to define and delineate the water-bearing openings that supply the large yields. These determinations were used to develop methods for selecting

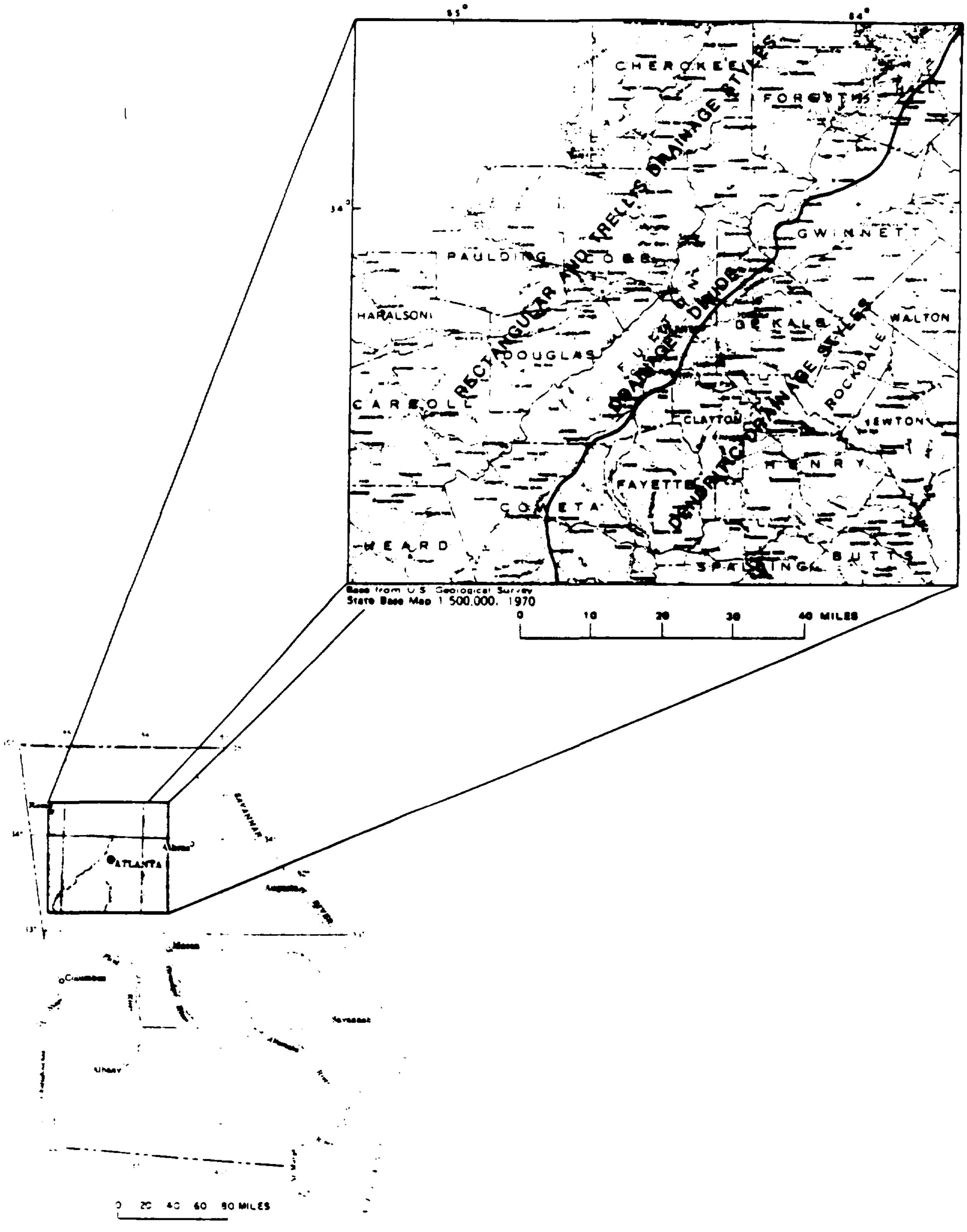

Figure 1. Location of study area.

high-yielding well sites in a variety of geologic and topographic settings throughout the GAR.

The nature and occurrence of water-bearing openings in various rock types were studied by using borehole geophysical techniques. Sonic televiewer logs of well bores were the best available means of learning the character of deep-seated fractures that supply large well yields in places of seemingly low yield potential.

Three test wells were drilled to investigate the yield potential of different geologic settings and to learn the nature of water-bearing openings. Pumping tests were run on two of the test wells to provide drawdown and recovery data needed to estimate yields. Core drilling was done beside two wells to confirm the horizontal nature of water-bearing fractures observed by borehole geophysical logs. A fourth test well was drilled to learn whether a linear feature was underlain by a zone of fracture concentration.

High-yielding well sites and water-bearing units were studied in detail in Coweta, Fayette, Clayton, and Henry Counties in an attempt to discover methods for locating sites capable of supplying large quantities of well water. Large quantities of well water soon may be needed in these counties for supplemental supply.

Physiography and Climate

Most of the report area is a broad rolling upland or plateau that, as a whole, is topographically homogeneous. Almost all of the cities and larger towns are on uplands, away from the rivers and broad valleys (LaForge and others, 1925). The plateau is inclined to the southeast, having average altitudes of 1,000 to 1,200 ft in the northwest and about 700 ft in the southeast. The maximum altitude is 2,300 ft on Pinelog Mountain in Cherokee County; the minimum altitude is 527 ft at Jackson Lake in Newton County. The average altitude of the report area is about 1,000 ft.

The northwestern part of the area is drained by the Chattahoochee and Coosa Rivers. The southeastern part is drained by the Flint and Ocmulgee Rivers.

Major cities in the area include Atlanta, Gainesville, Marietta, Decatur, Newnan, Carrollton, Conyers, Covington, Canton, Cumming, and Lawrenceville.

The area has a mild climate with slightly cooler temperatues and a little less rainfall than the State averages. In Fulton County, the average January temperature is 44°F and the average July temperature is 78°F. Average annual rainfall is 47 to 48 inches, compared to a State average of 54 inches. There are two peak-rainfall periods: late winter and midsummer.

Previous Investigations

One of the earliest reports on ground water in the GAR appeared in McCallie's "Underground Waters of Georgia" (1908). A report by Herrick and LeGrand (1949) discussed the geology and ground-water resources of the Atlanta area. Their report covered 2,055 mi^2 of the "Atlanta area" and included data on dug, bored, and drilled wells.

A 1951 report by Carter and Herrick on water resources of the Atlanta Metropolitan Area summarized ground-water data from the Herrick and LeGrand (1949) report, and also discussed availability and quality of surface water in the area. Thomson and others (1956) reported on "The Availability and Use of Water in Georgia," in which the occurrence of ground water in the Piedmont was briefly discussed. Stewart and Herrick ([illegible]) reported on emergency water supplies for the Atlanta area. McCollum (196[illegible]) investigated the ground-water resources [illegible] geology of Rockdale County, one of [illegible] counties included in the present study.

Cressler (1970) reported on the geology and ground-water resources of Floyd and Polk Counties. Cressler and others (1979) presented results of a study on geohydrology in Cherokee, Forsyth, and eastern Bartow Counties.

LaForge and others (1925) discussed the drainage systems of the Georgia Piedmont. Staheli (1976) reported on drainage styles of the area's streams that have a bearing on the distribution of ground water in the GAR.

Acknowledgments

This study was made by the U.S. Geological Survey in cooperation with the Georgia Department of Natural Resources, Geologic Survey Branch. The authors wish to acknowledge the many people who gave assistance during this study. Hundreds of property owners throughout the study area willingly supplied information about their wells and permitted access to their property. The following companies and personnel furnished construction and yield data on large-yielding wells:

- Mr. W. A. Martin and Mrs. Mary Dutton, Virginia Supply and Well Co., Atlanta
- Mr. Jim Adams and Mrs. Willie A. Massey, Adams-Massey Well Drilling Co., Carrollton
- Mr. and Mrs. Ed Livingston, Explora Contractors, Inc., Conyers
- Mr. and Mrs. Hoyt W. Waller, Waller Well Co., Griffin
- Mr. Ray Ward of Ward Drilling Co., Inc., Powder Springs
- Mr. and Mrs. H. G. Holder, Holder Well Co., Covington
- Mr. Jimmy Fowler, Fowler Well Co., Cumming
- Mr. P. T. Price, Price Well Co., Dallas
- Weisner Drilling Co., Inc., Riverdale
- Askew Water Systems, Griffin

Thomas J. Crawford of West Georgia College devoted long hours to discussing the occurrence and availability of ground water in the western part of the report area, especially Carroll County. Many of his observations and methods for selecting well sites are included in this report. He also provided construction, yield, geologic, and location data for hundreds of wells in the Carroll County area.

City clerks and water department personnel provided information on locations, histories, and use of wells in numerous towns and cities of the GAR. These included the cities of Conyers, Hampton, Clarkston, Acworth, Lawrenceville, Flowery Branch, Senoia, Milstead, Riverdale, Jonesboro, Grayson, Brooks, Peachtree City, and Turin.

Appreciation is extended to Janet K. Groseclose for assistance in preparation of this manuscript.

Well-Numbering System

The GAR is covered by 111 7.5-minute topographic quadrangles and parts of quadrangles. Wells in this report are numbered according to a system based on the 7.5-minute topographic quadrangle maps of the U.S. Geological Survey. Each 7.5-minute quadrangle in Georgia has been given a number and a letter designation according to its location. The numbers begin in the southwest corner of the State and increase numerically eastward. The letters begin in the same place, but progress alphabetically to the north, following the rule of "read right up." Because the alphabet contains fewer letters than there are quadrangles, those in the northern part of the State have double letter designations, as in 9HH. (Refer to fig. 37.)

Wells in each quadrangle are numbered consecutively, beginning with number 1, as in 8CC1. Complete well numbers, as in 5CC11, are used in well tables and most illustrations. On plate 1 the well numbers lack quadrangle designations because of space limitations. The quadrangle designations for these wells can be obtained from figure 37 and from the inset on plate 1.

In table 7, which lists chemical analyses of well water, some wells retain numbers used in previous reports.

WATER-BEARING UNITS AND THEIR HYDROLOGIC PROPERTIES

The part of the GAR included in this study lies wholly within the Piedmont physiographic province (Clark and Zisa, 1976; Fenneman, 1938). The area is underlain by a complex of metamorphic and igneous rocks that have been divided by various workers into more than 50 named formations and unnamed mappable units. Individual rock units range in thickness from less than 10 ft to possibly more than 10,000 ft.

Regional stresses have warped the rocks into complex folds and refolded folds, and the sequence has been injected by igneous plutons and dikes and broken by faults. Erosion of these folded and faulted rocks produced the complex outcrop patterns that exist today. The large number of rock types in the area and their varied outcrop patterns greatly complicate the occurrence and availability of ground water in the area. Nevertheless, many of the more than 50 named formations and unnamed mappable units in the GAR are made up of rocks that have similar physical properties and yield water of comparable quantity and chemical quality. Thus, for convenience, the rocks in the report area have been grouped into nine principal water-bearing units and assigned letter designations. The areal distribution of the water-bearing units and their lithologies are shown on plate 1. Data on wells in the water-bearing units are summarized in tables 1-3.

OCCURRENCE AND AVAILABILITY OF GROUND WATER

Ground water in the GAR occupies joints, fractures, and other secondary openings in bedrock and pore spaces in the overlying mantle of residual material. Water recharges the underground

Table 1.—Summary of well data for the Greater Atlanta Region

Water-bearing unit	Number of wells	Yield (gal/min)		Depth (ft)		Casing depth (ft)		Topography (percent of wells in each setting)						
		Range	Average	Range	Average	Range	Average	Slope	Broad lowlands	Uplands-ridge crests	Draw, hollow	Stream or lake	Saddle	Other
A Amphibolite-gneiss-schist	385	20-275	56	35-2,175	294	0-200	60	22	35	22	4	11	2	4
B Granitic gneiss	166	20-348	72	40-825	271	3-266	54	33	45	2	14	6	0	0
C Schist	185	20-150	47	67-700	[illegible]	[illegible]	53	19	19	27	20	11	4	0
D Biotite gneiss	70	20-351	56	82-710	[illegible]	[illegible]	56	20	27	36	6	11	0	[illegible]
E Mafic	32	20-471	79	67-386	[illegible]	[illegible]	46	17	35	28	3	17	0	
F Granite	43	20-150	43	43-422	[illegible]	[illegible]	57	30	30	15	15	10	0	
G Cataclastic	55	20-225	74	110-800	323	[illegible]	34	4	75	15	4	2	0	
H Quartzite	12	20-200	72	122-500	297	[illegible]	58	45	9	27	18	0	0	
J Carbonate	5	31-150	76	240-505	376	28-314	138	0	100	0	0	0	0	

Table 2.—Summary of well data for the north half of the Greater Atlanta Region

Water-bearing unit	Number of wells	Yield (gal/min) Range	Yield (gal/min) Average	Depth (ft) Range	Depth (ft) Average	Casing depth (ft) Range	Casing depth (ft) Average	Topography (percent of wells in each setting): Slope	Broad lowlands	Uplands-ridge crests	Draw, hollow	Stream or lake	Saddle	Other
A Amphibolite-gneiss-schist	107	20–200	53	55–675	220	12–187	52	25	28	23	9	12	2	1
B Granitic gneiss	6	20–200	81	170–337	235	31–140	68	50	0	33	0	17	0	0
C Schist	127	20–150	46	67–600	183	4–144	53	16	14	26	26	12	6	0
D Biotite gneiss	16	25–110	54	98–500	252	14–129	65	18	9	36	18	18	0	0
E Mafic	11	20–100	47	67–375	148	10–80	43	22	45	33	0	0	0	0
F Granite	17	20–75	39	43–398	152	11–72	38	20	33	7	27	13	0	0
G Cataclastic	0	—	—	—	—	—	—	—	—	—	—	—	—	—
H Quartzite	10	20–200	71	122–500	280	30–85	57	56	0	22	22	0	0	0
J Carbonate	4	31–85	58	240–505	399	28–314	164	0	100	0	0	0	0	0

Table 3.—Summary of well data for the south half of the Greater Atlanta Region

Water-bearing unit	Number of wells	Yield (gal/min) Range	Yield (gal/min) Average	Depth (ft) Range	Depth (ft) Average	Casing depth (ft) Range	Casing depth (ft) Average	Topography (percent of wells in each setting): Slope	Broad lowlands	Uplands-ridge crests	Draw, hollow	Stream or lake	Saddle	Other
A Amphibolite-gneiss-schist	278	20–275	58	35–2,175	320	0–200	63	20	38	22	3	10	2	5
B Granitic gneiss	160	20–348	72	40–825	273	3–266	54	23	33	30	10	4	0	0
C Schist	58	20–150	48	72–700	243	19–125	56	24	32	26	8	8	6	0
D Biotite gneiss	54	20–351	56	82–710	275	7–140	53	21	32	36	2	9	0	0
E Mafic	21	25–471	116	83–386	214	3–[illegible]	47	15	30	25	5	25	0	0
F Granite	26	20–150	45	77–422	218	[illegible]	[illegible]	36	28	20	8	8	0	0
G Cataclastic	55	20–225	74	110–800	323	3–[illegible]	[illegible]	4	75	15	4	2	0	0
H Quartzite	2	50–100	75	240–500	370	--	[illegible]	0	50	50	0	0	0	0
J Carbonate	1	150	—	285	—	32	—	0	100	0	0	0	0	0

openings by seeping through this material or by flowing directly into openings in exposed rock. This recharge is from precipitation that falls in the area.

Unweathered and unfractured bedrock in the report area has very low porosity and permeability. Thus, the quantity of water that a rock unit can store is determined by the capacity and distribution of joints, fractures, and other types of secondary openings. The quantity of stored water that can be withdrawn by wells depends largely on the extent to which the rock openings are interconnected.

The size, spacing, and interconnection of openings differ greatly from one type of rock to another and with depth below land surface. Open joints and fractures tend to become tighter and more widely spaced with increasing depth. Joints and other openings in soft rocks such as phyllite tend to be tight and poorly connected; wells in rocks of this character generally have small yields. On the other hand, openings in more brittle rocks such as quartzite and graywacke tend to be larger and are better connected; wells in these rocks normally supply greater yields. Other rocks, including amphibolite, schist, and gneiss, are variable in the size and connection of secondary openings and generally yield small to moderate quantities of water to wells. Carbonate rocks, which include marble, can contain much larger and more extensively interconnected fracture systems. Openings in carbonate rocks commonly are enlarged by solution, and are capable of transmitting large quantities of water.

Effects of Drainage Style

The GAR is divided nearly in half by the Chattahoochee River, which follows a comparatively straight southwesterly course for nearly 110 miles across the area (fig. 1). Streams in the north half of the area, including the Chattahoochee River and its tributaries, mainly have rectangular and trellis drainage styles. In contrast, streams in the south half of the area, beginning at about the south edge of the Chattahoochee River basin, have a dendritic drainage style (Staheli, 1976).

Streams having rectangular drainage style flow in strongly angular courses that follow the rectangular pattern of the joints that break up the rocks. Areas having trellis drainage style are characterized by strongly folded and dipping rocks; the larger streams follow the outcrops of less resistant rocks and tributaries enter at right angles across the dip of the strata (Lobeck, 1939, p. 175). All of the streams in the north half of the area show the influence of geologic control, their drainage styles reflecting the varied outcrop pattern, the different lithologies present, and the geologic structure.

In the south half of the area, the dendritic drainage style is indicative of streams that developed independently of the underlying geology (LaForge and others, 1925; Staheli, 1976). According to Staheli (1976, p. 451), dendritic drainage, in which streams run in all directions like the branches of a tree, probably was established on some preexisting surface and later superimposed on the underlying crystalline rocks. Such streams are said to be superimposed when they acquire a course on nearly flat-lying material that covered the rocks beneath. Streams flowing on the veneer of material that covers the bedrock are superimposed above the concealed rocks. When rejuvenated by uplift, they become incised and develop courses without regard to the structure or lithology of the underlying rocks. Eventually, the cover material may be entirely removed and then only the physiographic pattern of the streams will suggest their having been let down from a superimposed [illegible]ition (Lobeck, 1939, p. 173).

According to Staheli (1976, p. [illegible], to explain the different drainage [illegible]es in regions underlain by similar ro[illegible] structures, it is suggested that an earlier Coastal Plain sedimentary cover buried the Piedmont and extended inland at least to the Chattahoochee River valley. Thus, according to Staheli, drainage to the north developed originally on Piedmont rocks and so reflects their structural orientations. Staheli believes that streams south of the Chattahoochee River valley developed as consequent streams on a flat Coastal Plain cover. These streams extended headward as sea levels lowered, developed dendritic drainage, and eventually became superimposed across regional Piedmont structures. Thus, the general area of the Chattahoochee River valley might well coincide with a fossil Fall Line in Georgia (Staheli, 1976, p. 451). As Staheli points out, in areas near the Chattahoochee River, the drainage pattern suggests that higher, more resistant rocks could have existed as islands that locally controlled stream development even though the lower areas were covered by Coastal Plain sediment. For example, drainage obviously has been diverted by such prominences as Stone Mountain.

Observations made during the present study indicate that in the south half of the GAR, many of the smaller elements of the drainages, such as draws, hollows, and intermittent streams in the uppermost headwaters areas seem to have developed under geologic control. The presence of geologic control is indicated by smaller drainages that parallel prominent joint sets or that are alined with bedrock foliation. Presumably these late-forming drainages were established after removal of a preexisting cover and, therefore, developed under geologic control. The fact that the smaller drainages may reflect bedrock weaknesses, whereas the larger streams generally may not, has a profound influence on the occurrence of ground water in the south half of the GAR and on the methods that can be used successfully to locate large ground-water supplies. The relations between drainage styles and the occurrence of ground water, and the effects that drainage styles have on the methods that can be used to locate sites for high-yielding wells, are discussed in later sections of this report.

AVAILABILITY OF LARGE GROUND-WATER SUPPLIES

The quantity of ground water available in the GAR varies greatly with the location, rock type, topographic setting, drainage style, and the geologic structure. In some areas, most wells yield less than 3 gal/min, which generally is considered a minimum requirement for domestic and stock supplies. In more favorable areas, yields commonly range between 3 and 10 gal/min. It should be pointed out, however, that obtaining this quantity may require drilling in more than one site.

High-yielding wells—ones that supply 20 gal/min or more—generally can be developed only where the rocks possess localized increases in permeability. This occurs mainly in association with certain structural and stratigraphic features, including: (1) contact zones between rock units of contrasting character, (2) contact zones within multilayered rock units, (3) fault zones, (4) stress relief fractures, (5) zones of fracture concentration, (6) small-scale structures, including joints, foliation planes, and fold axes, that localize drainage development, (7) folds that produce concentrated jointing, and (8) shear zones. Other factors, such as topographic setting, drainage style, rock type, depth of weathering, thickness of soil cover, and the pervasiveness and orientation of foliation can interact to increase or decrease the availability of ground water. The nature and occurrence of structural and stratigraphic features known to increase bedrock permeability, and the relation of these features to drainage style, topography, and other factors, are discussed in the following sections.

Contact Zones

Yields of 50 to 200 gal/min may be obtained from contact zones between rock units of contrasting character. The largest yields generally are obtained where massive homogeneous rocks such as granite, which are very resistant to weathering, are in contact with foliated rocks of high feldspar content that weather rapidly and deeply. The most productive contacts generally are ones in which a resistant rock is overlain by a rapidly weathering rock (T. J. Crawford, West Georgia College, oral commun., 1979). Examples of rock types and certain physical characteristics of rocks that form productive contact zones are shown below:

1. Granite or granitic gneiss overlain by schist low in quartz content.

2. Granite overlain by hornblende, feldspar (50 percent) gneiss.

3. Granite overlain by feldspar gneiss.

4. Massive granite overlain by foliated gneiss.

5. Massive, homogeneous rocks, poorly jointed and foliated and resistant to weathering, overlain by foliated, well-jointed, deeply weathering rocks (feldspar-rich and foliated rocks weather most rapidly and deeply).

To produce the highest yields, the rocks overlying the massive homogeneous rock should be: (1) foliated, (2) have a high feldspar content, the higher the better, (3) differ mineralogically, and (4) occupy a topographic position favorable to recharge.

Contact zones occur throughout the GAR. Many potentially high-yielding contacts are shown on plate 1, and on detailed geologic maps that are available for parts of the area. (See references.)

Contact zones between rock units of contrasting character generally may be recognized in road cuts, quarries, and freshly scraped areas, and their presence also may be indicated by changes in the character of the saprolite and by changes in topography. For example, the contact between granite or granitic gneiss and a feldspathic schist may be indicated by sandy soil or saprolite containing small mica flakes derived from the granite or gneiss, that abruptly changes to a clay soil containing large mica flakes derived from the schist. Also, the area underlain by granite or gneiss may be characterized by numerous exposures of fresh rock, whereas the schist area may have no rock exposed. Contact zones between resistant and less resistant rocks also may be indicated by subtle changes in topography. The terrain over the weaker rocks may be slightly lower and flatter than that over the resistant rocks. Valleys and draws may trend parallel to the contact zone.

In the north half of the GAR, wells derive large yields from several types of contact zones. Well 12HH6 furnishes 150 gal/min to the city of Cumming, Forsyth County, from quartzite of Unit H at the contact with schist of Unit C. Well 5CC-39 in Carroll County supplies a subdivision with 100 gal/min from a contact zone between "granite" of Unit F and schist of Unit C.

In the south half of the area, comparatively few wells supply water from contact zones between rock units of contrasting character. This probably is because in an area dominated by dendritic drainage, the contacts rarely occupy topographic settings that favor increased ground-water circulation. Large yields are, however, supplied by wells that tap contact zones between mafic rocks of Unit E and various types of country [illegible]k. Well 14DD2, near Milstead in R[illegible]le County, supplies 100 gal/min from [illegible] contact between a diabase dike (Unit [illegible] and granitic gneiss of Unit B. Conta[illegible]es between differing rock units ar[illegible]e-spread in the south half of the ar[illegible]nd may be productive where they underlie draws, stream valleys, and other low areas that favor increased ground-water circulation and provide adequate recharge.

Other potentially permeable contact zones occur between rock layers of different character within multilayered rock units such as Unit A. Areas underlain by Unit A are shown on plate 1. Although individual contact zones cannot be shown on maps of the scale used in this report, they may be located by field surveys. Contact zones of this type supply water to wells in both the north and south halves of the area. Well 12HH7 in Forsyth County derives 90 gal/min from contact zones within the multilayered rock of Unit A.

The yield potential of individual contact zones may be estimated from their topographic settings, especially their relation to local drainages. The largest yields generally can be expected from contacts that lie in and trend parallel to draws and stream valleys that are downgradient from sizable catchment areas overlain by deep soil. Contacts that cross such drainages at various angles also may be productive. Contact zones in multilayered rock units generally supply the largest yields to wells drilled on the downdip side of draws and stream valleys that parallel the contacts.

Construction of the "people mover" tunnel at Hartsfield-Atlanta International Airport provided an opportunity to observe firsthand the effects that topographic setting, catchment area size, and quantity of available recharge have on the long-term yield potential of contact zones in multilayered rocks. The tunnel site, which extended in an east-west direction for nearly a mile (fig. 2) over interlayered schist, gneiss, and amphibolite of Unit A and gneiss of Unit B, was being dewatered along the north and south sides by wells drilled at intervals of about 100 ft. The dewatering wells were 110 ft deep, gravel packed to the top of rock, and lined with slotted casing to total depth. Observation wells 60 ft or more deep and gravel packed to total depth were spaced every 200 ft along both sides of the tunnel site to permit the monitoring of water levels.

The initial yields of the dewatering wells reportedly ranged from near 0 to about 70 gal/min, averaging about 10 gal/min. Submersible pumps installed in each well discharged water at the rate of about 17 gal/min, cycling on and off as needed to prevent excessive drawdown. As the dewatering operation progressed, many pumps were off most of the time; only the highest yielding wells pumped steadily.

Because new groups of wells were intermittently completed and brought on line, and older wells were pumping less often, the most practical means of determining the total pumpage of the dewatering wells was to measure the flow in discharge ditches that collected water from wells on the north and south sides of the tunnel site. The first measurement, made February 2, 1977, showed the total pumpage to be about 100 gal/min (not accounting for evapotranspiration or seepage). With the addition of more pumping wells, the discharge increased to about 1,000 gal/min on August 1. By October 10, many wells had stopped pumping and the total discharge declined to about 500 gal/min. On January 11, 1978, the flow was reduced to about 100 gal/min and by March 31 the flow, which was too small to measure with a pigmy current meter, was estimated to be less than 50 gal/min. The flow in the discharge ditches remained too low to measure for the remainder of the dewatering operation. By June 28, 1978, most wells had stopped pumping and the highest yielding wells were cycling irregularly.

The dewatering operation proved successful for the intended purpose of lowering the water table below the bottom of the construction ditch. Ground-water levels at the beginning of the operation ranged from about 4 to 12 ft below land surface. With the start of pumping, the

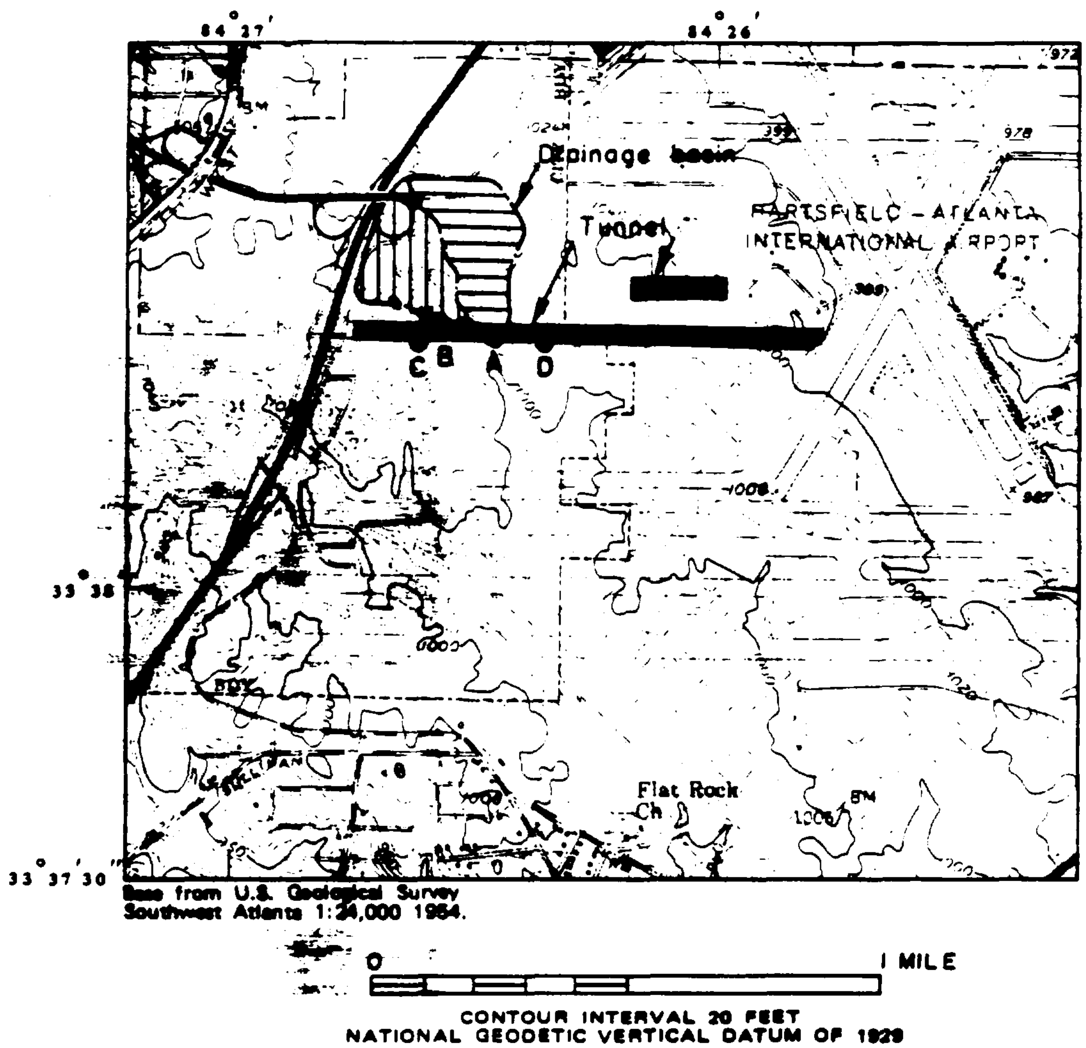

Figure 2. Well sites in the "people mover" tunnel area, Hartsfield-Atlanta International Airport. Sites A and B are downgradient from catchment areas supplying recharge; sites C and D are in interstream areas receiving little recharge.

water level in some observation wells declined more than a foot per day. Other wells responded slowly and showed little change in water level after 4 days of pumping. With continued pumping, however, the water levels in all observation wells declined, and by May 25, 1978, were drawn down to depths of 16 to 38 ft below land surface. By August 1978 the water level was generally in the range of 27 to 39 ft below land surface, well below the bottom of the construction ditch. The low water level kept the ditch free of seepage except immediately following heavy rains. This decline in water levels and the reduced yield of the few active wells, clearly indicated that ground-water storage in the saprolite largely had been depleted.

The monitoring of water levels also revealed that saprolite of layered rocks at the site (amphibolite, gneiss, and schist) has strong preferential permeability. Observation wells that had shown little response to nearby pumping wells located across the strike of the rocks immediately began drawing down with the start-up of wells along the strike. Preferential permeability in the saprolite of layered rocks (documented by Stewart, 1964) accounts for differing rates of drawdown that occurred during the dewatering operation.

The highest yielding well (70 gal/min at site A, fig. 2) penetrated interlayered schist, gneiss, and amphibolite and probably derived water from more than one interformational contact zone. Other wells in the 20-30 gal/min yield range (sites B, C, and D, fig. 2) penetrated interlayered schist, granite gneiss, and some amphibolite.

The dewatering operation demonstrated the importance of locating high-yielding wells in topographic settings that can supply recharge in quantities large enough to balance intended withdrawals. After months of pumping, only the wells in stream valleys downgradient from sizable catchment areas (sites A and B, fig. 2) continued to supply significant yields. Wells in interstream areas (sites C and D, fig. 2), on the other hand, where the quantity of recharge is limited, declined in yield and eventually were pumped dry.

The response of this well field to pumping was much the same as others in the GAR and adjacent areas of the Georgia Piedmont. Over the long term, wells tapping permeable contact zones or other types of permeable zones, no matter how large the initial yield, can supply water only at the rate it is replaced by recharge. Normally, the recharge needed to sustain high well yields for extended periods, and especially through prolonged droughts, is available only in stream valleys, drainages, and draws that receive constant recharge from large catchment areas, or in broad flat areas covered by deep saturated soil. <u>A leading cause of declining well yields in the report area is the practice of locating wells without regard to the adequacy of available recharge.</u> For this reason, successful methods for locating high-yielding well sites emphasize the importance of considering the adequacy of available recharge.

Fault Zones

Faults in the report area consist of two types: (1) large fault zones, such as the Brevard Zone (Unit G, plate 1), that have extensive rock deformation (cataclasis) and numerous small faults within the zones, and (2) faults that displace rock units without extensive deformation around the fault zone.

In large fault zones, shearing and deformation within the zone may reduce the overall permeability of some types of rock and increase the permeability of others. Limited data indicate that wells in broad lowland settings may be [illegible] productive in the Brevard Zone. [illegible] to the small number of wells and to [illegible] exposures in lowland areas, however, [illegible] are not available to indicate which [illegible] ologies within the Brevard Zone [illegible] most productive.

Faults that displace rock units without extensive deformation may be highly permeable and supply large well yields. The largest yields generally are available from faults that involve both resistant rocks such as massive gneiss or granite (Units B and F) and less resistant rocks such as feldspathic schist (Unit C). Increases in permeability along these faults result from differential weathering of the contrasting rock types, much the same as occurs in permeable contact zones. Although fractures produced by movement on the faults typically have been healed by mineralization and no longer are fully open, the shearing and mixing of rock types contribute to increasing the permeability along the faults. A good example of a permeable fault zone is the one that extends from eastern Carrollton, Carroll County, southwestward more than 5 miles, involving schist (Unit C) and granite (Unit F). Several wells in the fault zone yield 20 to 80 gal/min.

Work in crystalline rocks in eastern Georgia by David C. Prowell (U.S. Geological Survey, oral commun., 1980) has shown that relatively recent faults are unmineralized and contain open fractures. The faults consist of one or more zones 10 to 30 ft wide in which the rock is broken by numerous vertical or nearly vertical fractures 1 to 4 inches apart. Between the individual fractures, the rock commonly is brecciated and the pieces are rotated at various angles. A 4- to 6-inch wide zone of fault gouge (rock flour) generally occurs near the middle of each fracture zone. The fractures in the fault zone are open and should be capable of storing and transmitting large volumes of ground water. Although no recent faults were recognized during the present study, they may be present in the GAR. Where they project into topographically low areas favoring increased recharge, recent faults should supply large well yields.

According to Prowell (U.S. Geological Survey, oral commun., 1980), except in fresh-rock exposures such as in deep road cuts and quarries, these recent faults are difficult to recognize. Their presence cannot be detected in the soil horizon, but relicts of breccia or variously oriented rock fragments may remain visible in saprolite. It is not known whether the faults would produce a surface trace recognizable as a topographic feature such as a lineament, but it seems likely that they might bring about noticeable changes in vegetative vigor. The likelihood of their producing lineaments probably would be greater in the north half of the area than in the south half.

Stress Relief Fractures

Water-bearing openings in crystalline rocks traditionally have been described as steeply inclined and "X"-shaped fractures and joints similar to those pictured in figure 3 (LeGrand, 1967, p. 6). These openings are reported to be most numerous and to have the largest water-bearing capacity near the surface and to become tighter and more widely spaced with increasing depth.

According to LeGrand (1967, p. 5), most of the interconnecting openings occur less than 150 ft below land surface and few extend deeper than 300 ft. Tradition also has held, as stated by LeGrand (1967, p. 1-2), that high-yielding wells are common where relatively low topographic areas and thick residual soils are combined, and low-yielding wells are common where hilltops and thin soils are combined. Accordingly, sites having the largest yield potential are assumed to be draws and valleys in or downgradient from large catchment areas having a deep soil cover. Sites having the lowest yield potential are narrow ridge tops and upland steep slopes having little, if any, soil cover.

From the beginning of this study, it was apparent that many high-yielding wells, particularly in the south half of the GAR, occupy topographic settings indicated by previous workers to have low

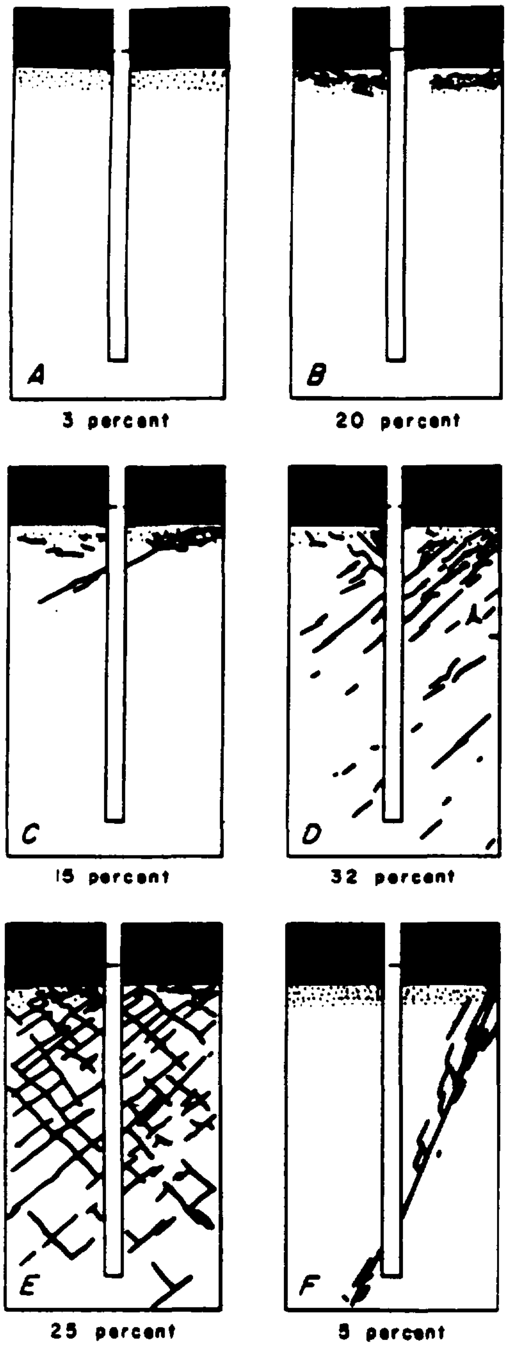

Figure 3. Six types of ground conditions showing distribution of fractures that influence the yields of wells. The stippled pattern represents soils and soft rock; the dashed line is the water table. The degree of frequency of the different types is shown in percentage. (LeGrand, 1967).

yield potential. These wells are on hilltops, ridge crests, and steep slopes, and many are in areas that have extensive rock outcrops and little or no soil cover. According to the statistical data presented by LeGrand (1967, p. 3), such sites should have only a slight chance of supplying large well yields. Moreover, about 14 percent of the high-yielding wells throughout the report area derive water from depths of 400 ft or more (table 9). Thus in the GAR, particularly in the south half of the area, a large percentage of the high-yielding wells derive water from bedrock openings more than 400 ft deep, which is a significant departure from the findings presented by LeGrand for wells in other crystalline rock areas.

Because of the inconsistancies between the occurrence of ground water in the GAR, especially in the south half of the area, and those reported from other crystalline rock areas, the authors decided to investigate the nature of water-bearing openings that supply large well yields. The intent was to identify whatever differences might exist between water-bearing openings in the GAR and those in other areas that could explain these inconsistencies.

Borehole Geophysical Logs

The most practical means available to study the nature of water-bearing openings in wells was borehole geophysical logs. A complete set of geophysical logs was run by the U.S. Geological Survey Southeast Region logger on test well 2 (8CC8) and 3 (9DD1). Logs also were run on high-yielding municipal wells in Turin, Coweta County, and Demorest in Habersham County and Blairsville in Union County northeast of the GAR. The results showed that the nature of bedrock openings could best be studied by using caliper and sonic televiewer logs. Caliper and sonic televiewer logs were run on five additional wells in different types of crystalline rocks and different topographic settings to learn more about the character of water-bearing openings.

The caliper log is a graph of well-bore diameter, and it is useful because it indicates fractures and other bedrock openings, and gives a general indication of the vertical dimension of each opening (fig. 4). By matching the caliper log with driller's records of where water entered the well, it generally is possible to identify water-bearing openings. However, the caliper log is unable to reveal details about the nature of the openings.

The sonic televiewer log makes possible the visual inspection of the entire well bore, providing detailed information about rock texture, foliation, and bedrock openings. The log is made by a geophysical probe transmitting a rotating sonic beam that reflects off the inside of the well bore and the walls of fractures and other openings. The reflected signal is electronically converted into visual images of the well bore, projected on a video screen, and photographed to provide a permanent record of the image. The photographs show variations in rock texture, layering, and foliation as shades of gray; and open fractures, deep voids, and eroded zones as areas of black (figs. 5 and 6). The images on the photographs are at a known vertical scale and are oriented with respect to north, providing a means for measuring the approximate height of openings, determining whether they are flat lying or inclined, and measuring the strike and dip of inclined features.

Televiewer logs revealed that water-bearing openings in high-yielding wells supplying 40 gal/min or more differed from what had been reported for crystalline rocks. The logs showed that in granitic gneiss and biotite gneiss and in quartz-mica schist, water-bearing openings consist of horizontal or nearly horizontal fractures 1 to 8 inches in vertical dimension and range in depth

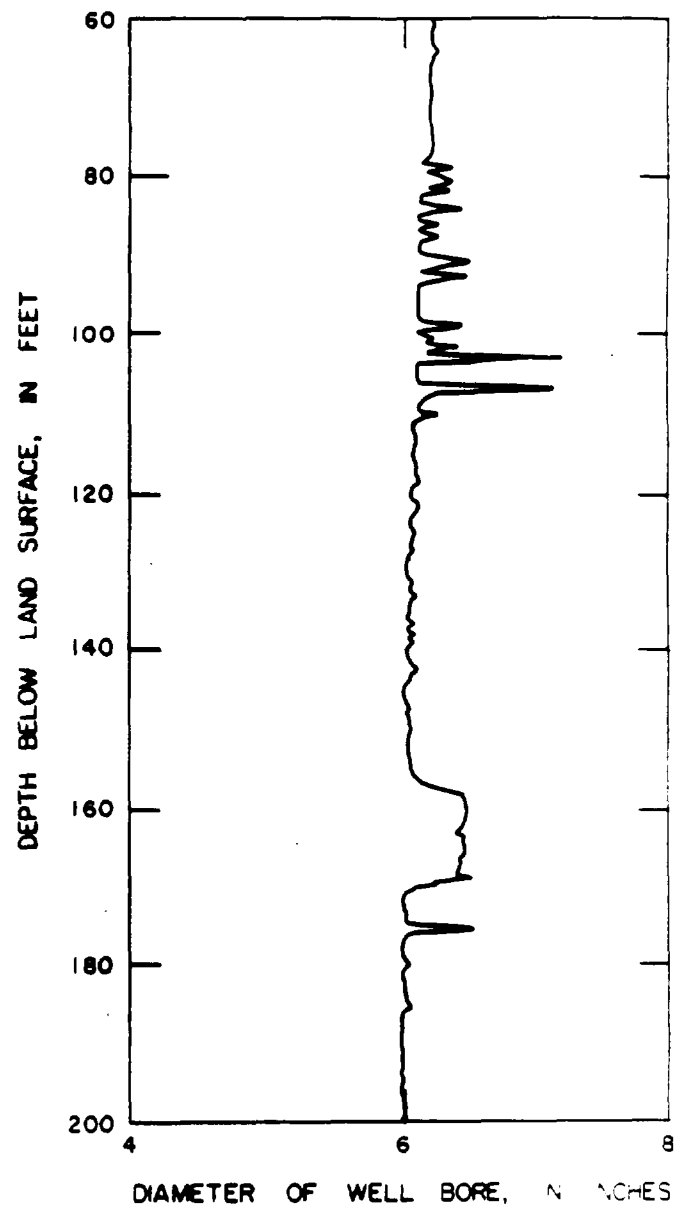

Figure 4. Caliper log of test well 2 (8CC8), Fulton County.

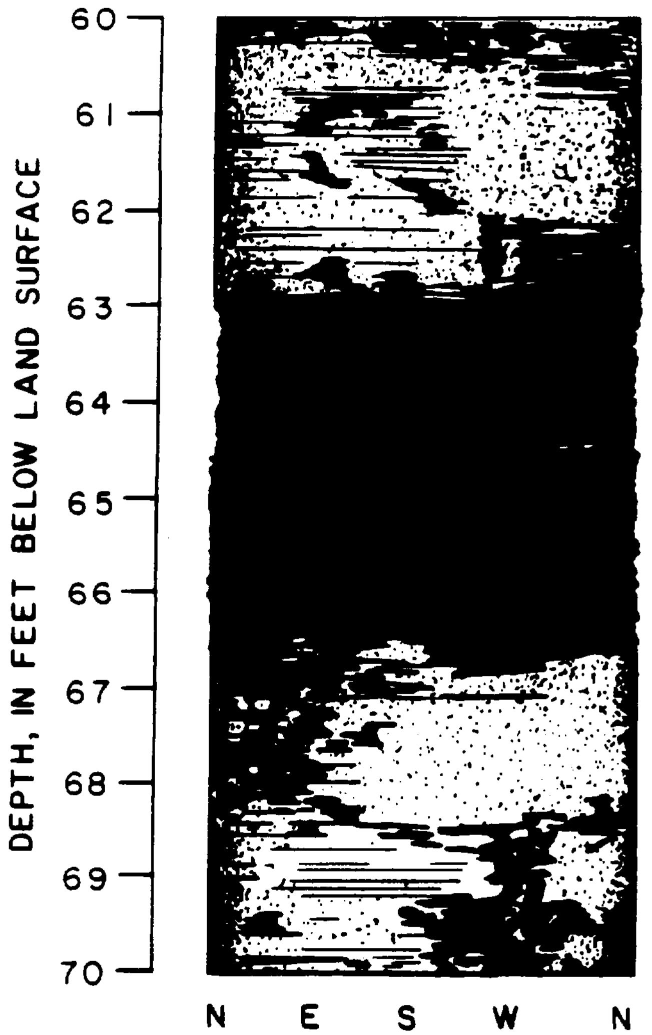

Figure 5. **Televiewer image of water-bearing fracture and weathered zone eroded by drill, test well 3 (9DD1). Letters at bottom of image refer to** compass quadrants.

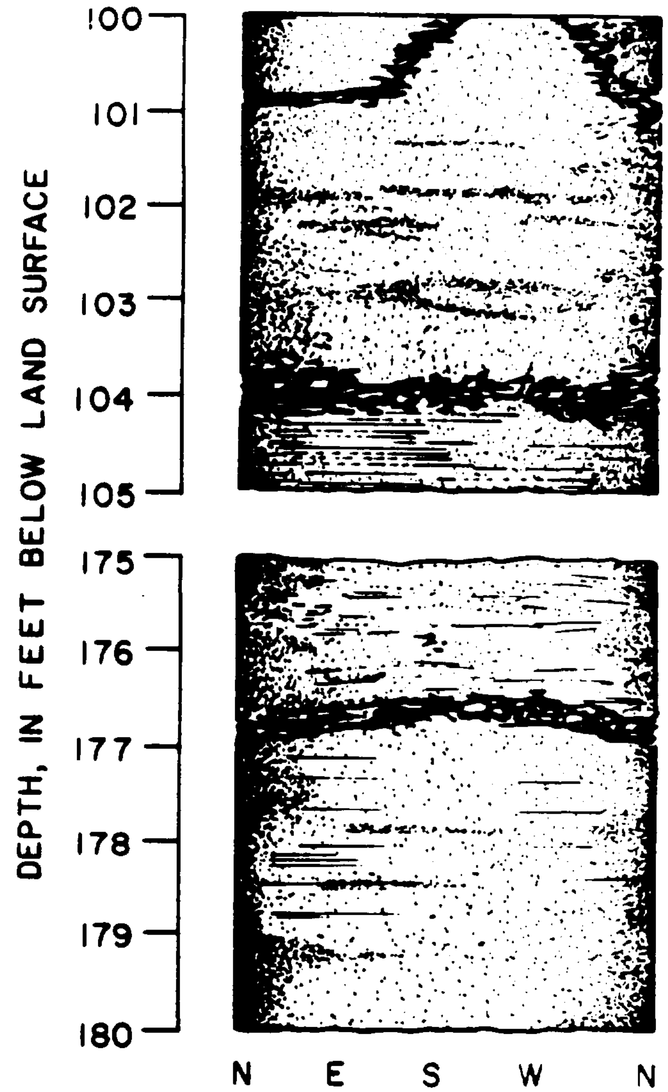

Figure 6. **Televiewer image** of non-water-**bearing high-angle** fracture at **100 feet, water-bearing** horizontal **fracture at** 104 feet, **and nearly horizontal** water-**bearing fracture at** 176.5 **feet, test well** 2 (8CC[illegible]). **Letters at bottom** of image **refer to compass** quadrants.

from 28 to 440 ft. Water-bearing openings in multilayered rock units consisting of granitic and biotite gneiss interlayered with schist were shown to be horizontal fractures 1 to 3 inches in vertical dimension occurring in the gneiss layers.

Drill Cores

To verify that the televiewer logs were being correctly interpreted and to examine the surfaces of horizontal fractures for possible slickensides or other evidence of horizontal movement, the bedrock was core drilled at two well sites. The core drilling was done by the U.S. Geological Survey using a special triple tube core barrel to insure that all of the core would remain intact so that the extent of fracturing and the weathering of fracture surfaces could be properly evaluated.

During the coring process, changes in drilling rate, rotation pressure, and water pressure, which indicated the presence of openings in the rock, were precisely recorded relative to hole depth so that the exact vertical dimension of the void could be calculated. Accordingly, coring runs were exactly 10 ft in length and the amount of void space indicated by measuring the actual rock core was compared with the drilling records about the voids. These measurements of the void spaces were within 10 to 20 percent of each other.

One core, from the site of well 13DD-90, Rockdale County, penetrated granitic gneiss and confirmed that the horizontal fractures and the enlarged soft zones had been correctly identified and measured (fig. 7). The other core, from the site of test well 2 (8CC8), Fulton County, penetrated interlayered gneiss and schist and confirmed correct identification and measurements of horizontal fractures in that well. The core also revealed weathered foliation-plane openings, mostly at the contacts of schist and gneiss layers, that had not been recognized as openings in the televiewer pictures (fig. 8). No evidence of horizontal displacement was found on any surfaces of the openings.

The horizontal nature of the observed water-bearing fractures, the range of depths at which they occur, the types of topographic settings they underlie, and the rock types in which they are present, all suggest that the openings may be stress relief fractures (Wyrick and Borchers, 1981). The mechanism for forming horizontal stress relief fractures seems to be the upward expansion of the rock column in response to erosional unloading (Billings, 1955, p. 93; Wyrick and Borchers, 1981, p. 12), as shown in figure 9. The formation of stress relief fractures seems to be dependent on the volume of overburden removed relative to the area being eroded, as in a broad stream valley (fig. 28), or from the area adjacent to a ridge or upland area, as commonly occurs with divide ridges.

Stress relief fractures probably do not lie entirely along a horizontal plane, but are very low dome-shaped structures that in cross section would appear as low arches (fig. 10). The fractures probably are circular or elliptical in plan view, are slightly inclined near the outer edges, and have the maximum void space near the center. Televiewer pictures indicate that stress relief fractures an inch or so high (which could be near the outer edge of the fracture) are inclined about 5 degrees. The arching may produce vertical fractures that extend toward the surface, providing avenues of recharge. They also may serve to connect two or more stress relief fractures, thereby forming a network of interconnected fractures.

Horizontal stress relief fractures seem to occur mainly in large bodies of granitic and biotite gneiss (water-bearing Units B and D), but they also are important in units consisting of [illegible] interlayered with schist (Unit A) [illegible] schist (Unit C) and amphibolite (U[illegible].

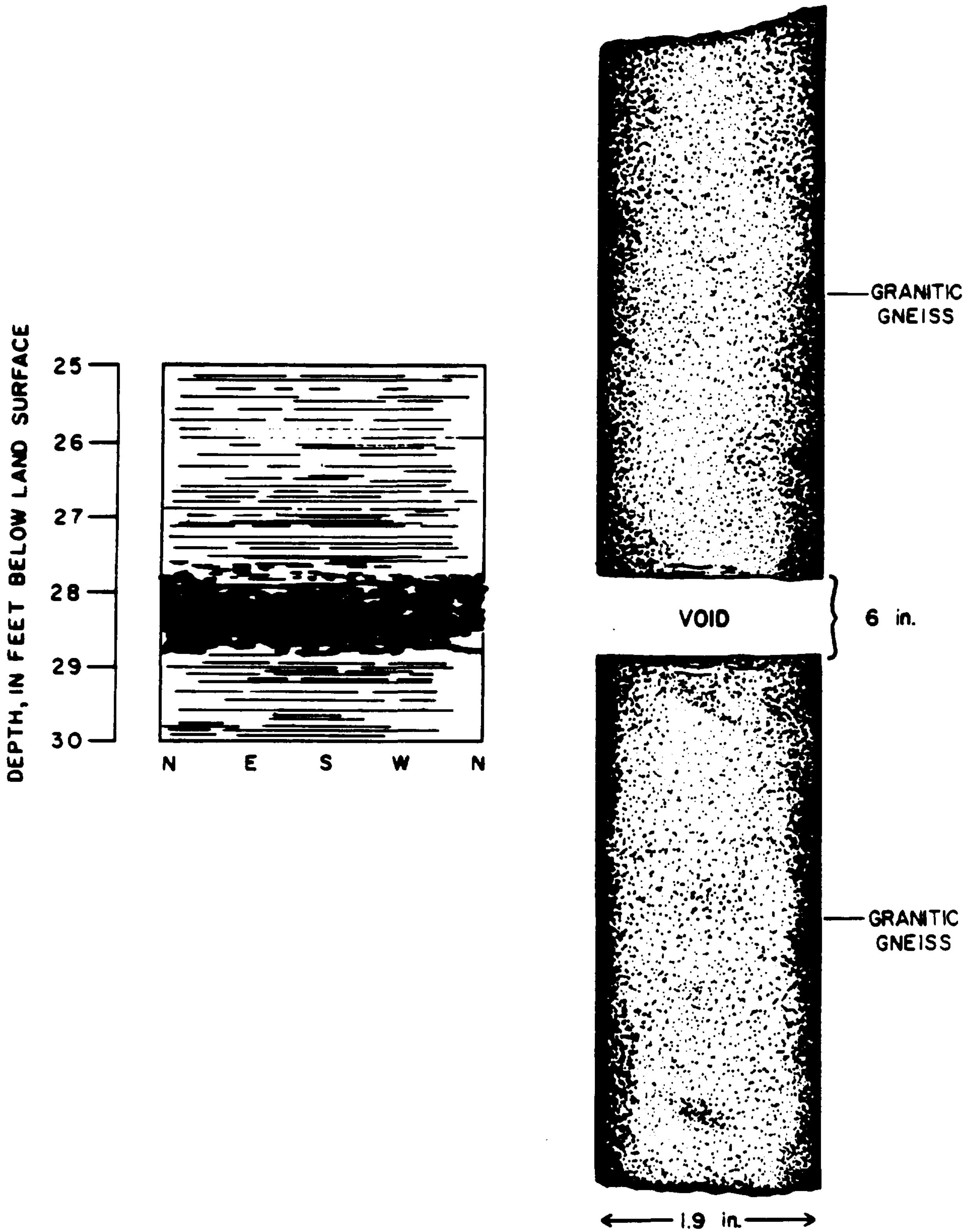

Figure 7. Comparison of televiewer image of horizontal water-bearing fra- ture with diagram of drill core, well 13DD90, Rockdale County.

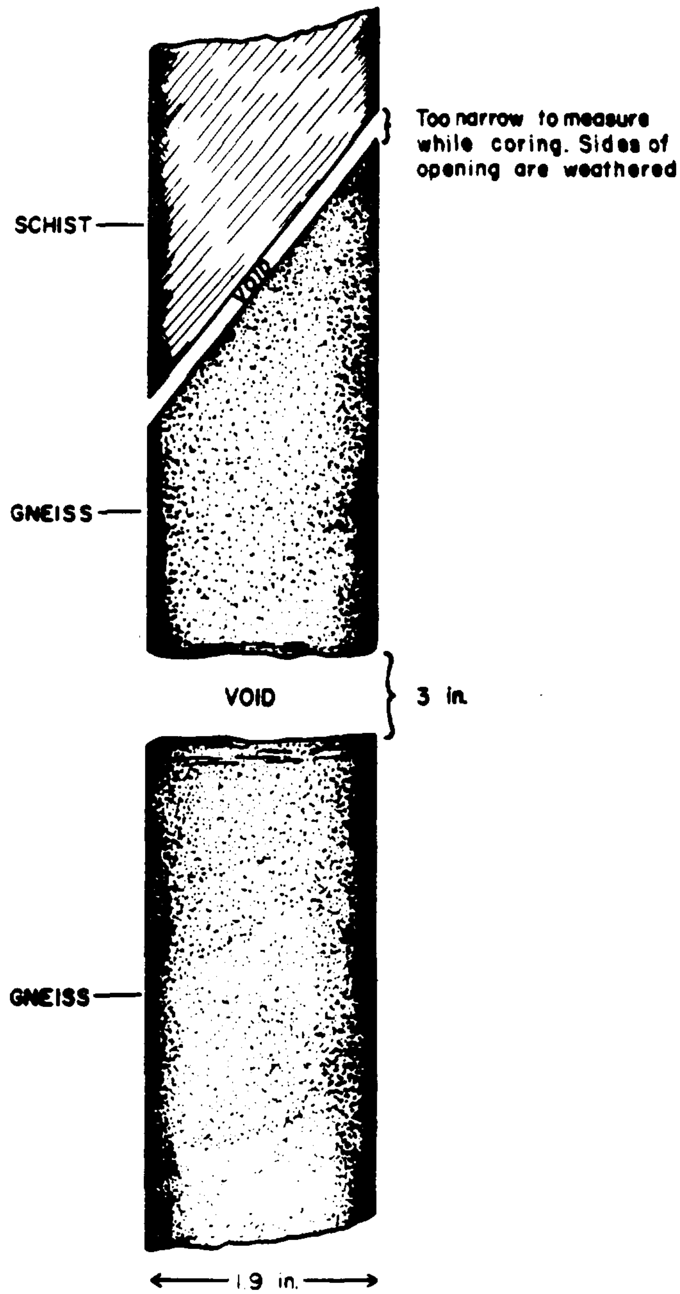

Figure 8. Diagram of drill core from test well 2 (8CC8), Fulton County, showing horizontal fracture in gneiss and opening parallel to foliation between schist and gneiss.

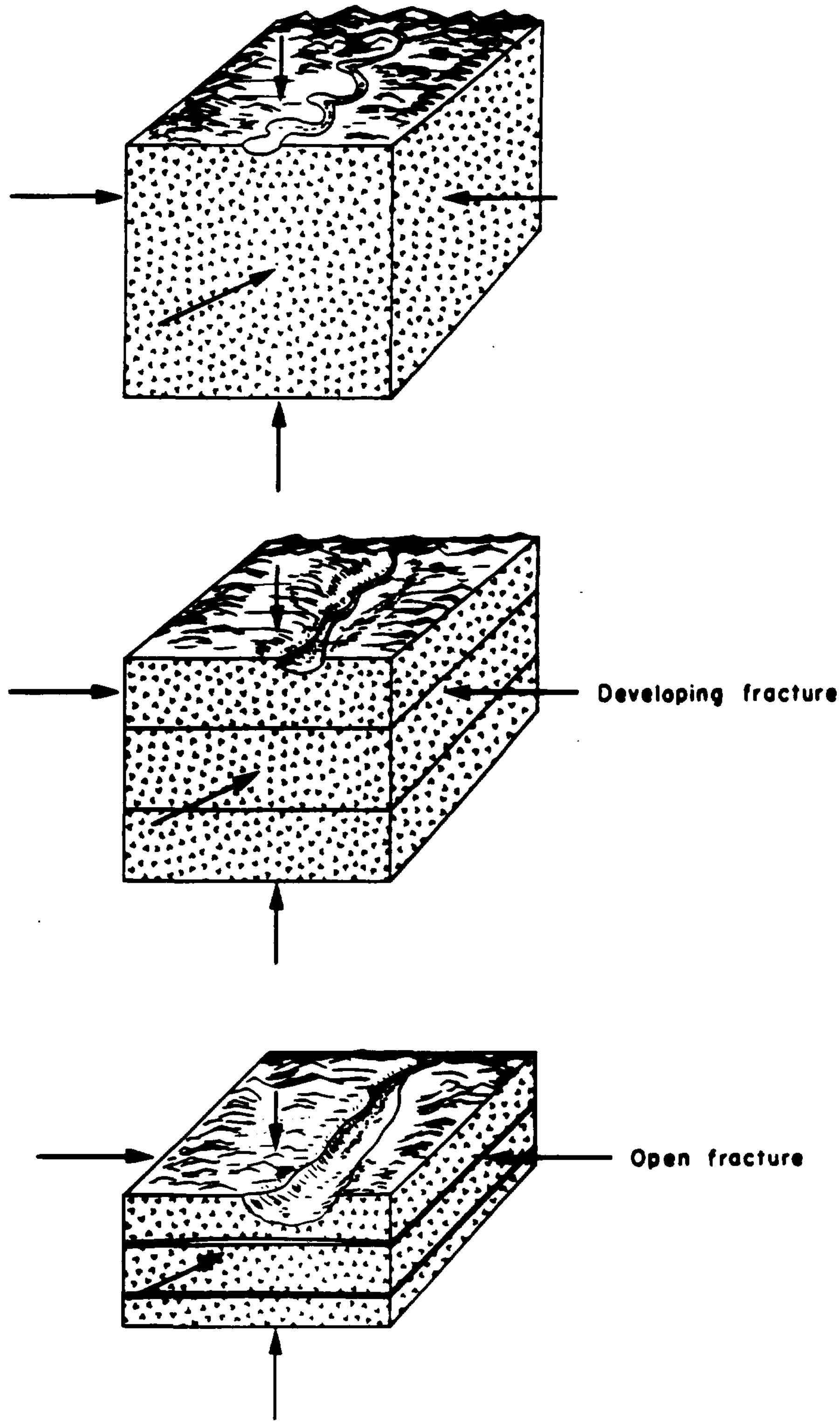

Figure 9. Stress relief fractures are believed to be caused by the upward expansion of the rock column in response to erosional unloading. Arrows represent the direction and their length represents strength of compressional stress.

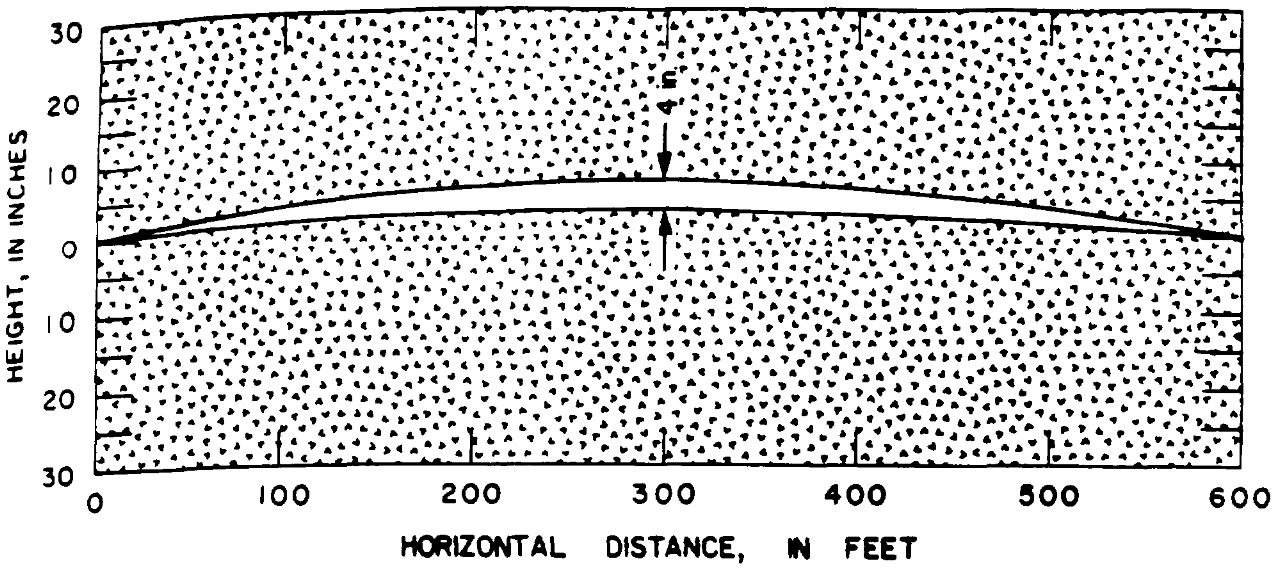

Figure 10. **Hypothetical cross section of a stress relief fracture. The fractures probably are low arches that have the largest opening near the center.**

Horizontal fractures probably form significant water-bearing openings in large bodies of gneiss in the south half of the area and possibly area-wide. Horizontal fractures were observed in one well (at Demorest, Habersham County, northeast of the GAR) in quartz-mica schist, and they may be a common occurrence in schist units having a high quartz content. Water-bearing stress relief fractures also may occur in granites, although none were identified during this study.

Bottom-Hole Fracture Wells

Driller's records show 25 wells in the report area that unquestionably derive large yields from openings at or near the bottom of the well. All of the wells share the characteristic of remaining dry, or essentially dry, during drilling until they penetrated one or two high-yielding fractures. The high-yielding fractures are at or near the bottom of wells because: (1) the large yields were in excess of the desired quantity and, therefore, drilling ceased, or (2) in deep wells yielding 50 to 100 gal/min or more the large volume of water from the fracture(s) "drowned out" the pneumatic hammers in the drill bits, effectively preventing deeper drilling. Four wells having identical characteristics were shown by sonic televiewer logs to derive water from horizontal fractures. Therefore, the writers believe that the bottom-hole fracture wells derive water from horizontal stress relief fractures.

Bottom-hole fracture wells are of particular interest because they include the highest-yielding wells in the study area. Construction data, topographic settings, and geology for 25 wells that derive water from bottom-hole fractures are given in table 4. The general locations of the wells are shown in figure 11.

In addition to the 25 wells liste table 4, several other wells in th share the characteristic of rema nearly dry during drilling until

Table 4.—Construction data, topographic setting, and water-bearing units of bottom-hole fracture wells

Well number	Water-bearing unit	Yield (gal/min)	Depth (ft)	Casing depth (ft)	Depth of water-bearing fracture (ft)	Topography
4CC2	C	100	328	—	325	Near head of large draw on slope of divide ridge.
7BB42	D	87	330	52	330	Near head of draw on divide ridge.
8AA10	A	200	352	85	320	Divide ridge surrounded by stream heads.
9CC18	A	30	405	50	110	Point of land.
9HH5	A	200	526	12	526	Do.
10AA9	A	200	175	—	—	Point of land projecting into stream valley and shear zone.
10CC11	B	100	160	18	150	Saddle on ridge at head of two draws.
10CC12	B	50	150	30	140	Point of land.
10EE5	D	110	450	27	443	Head of draw on ridge slope.
10EE29	G	100	430	50	430	Point of land projecting into flood plain.
10HH2	A,C	150	346	92	330	Broad point of land; at head of draw on ridge slope.
11CC8	A	40	345	56	335	Head of draw on ridge slope.
12BB5	A	100	105	55	65	Crest of broad ridge.
12CC14	B	150	146	126	140	Head of draw near crest of narrow ridge.
13CC58	A	100+	340	—	335	Point of land.
13DD55	B	120	550	34	540	Crest of divide ridge surrounded by steam heads.
13DD56	B	348	410	103	400	Head of draw on divide ridge surrounded by stream heads.
13DD69	B	172	435	25	430	Crest of divide ridge surrounded by stream heads.
13DD89	B	150	230	12	220	Do.
14CC14	A	34	200	10	173	Do.
14FF3	B	100	398	46	395	Ridge crest.
14FF7	E	254	265	54	250	Draw on ridge slope.
14FF8	E	471	302	30	290	Near head of draw on slope of divide ridge.
14FF9	E	400	352	40	340	Base of ridge in stream valley.
14FF10	E	270	386	20	330	Stream valley.

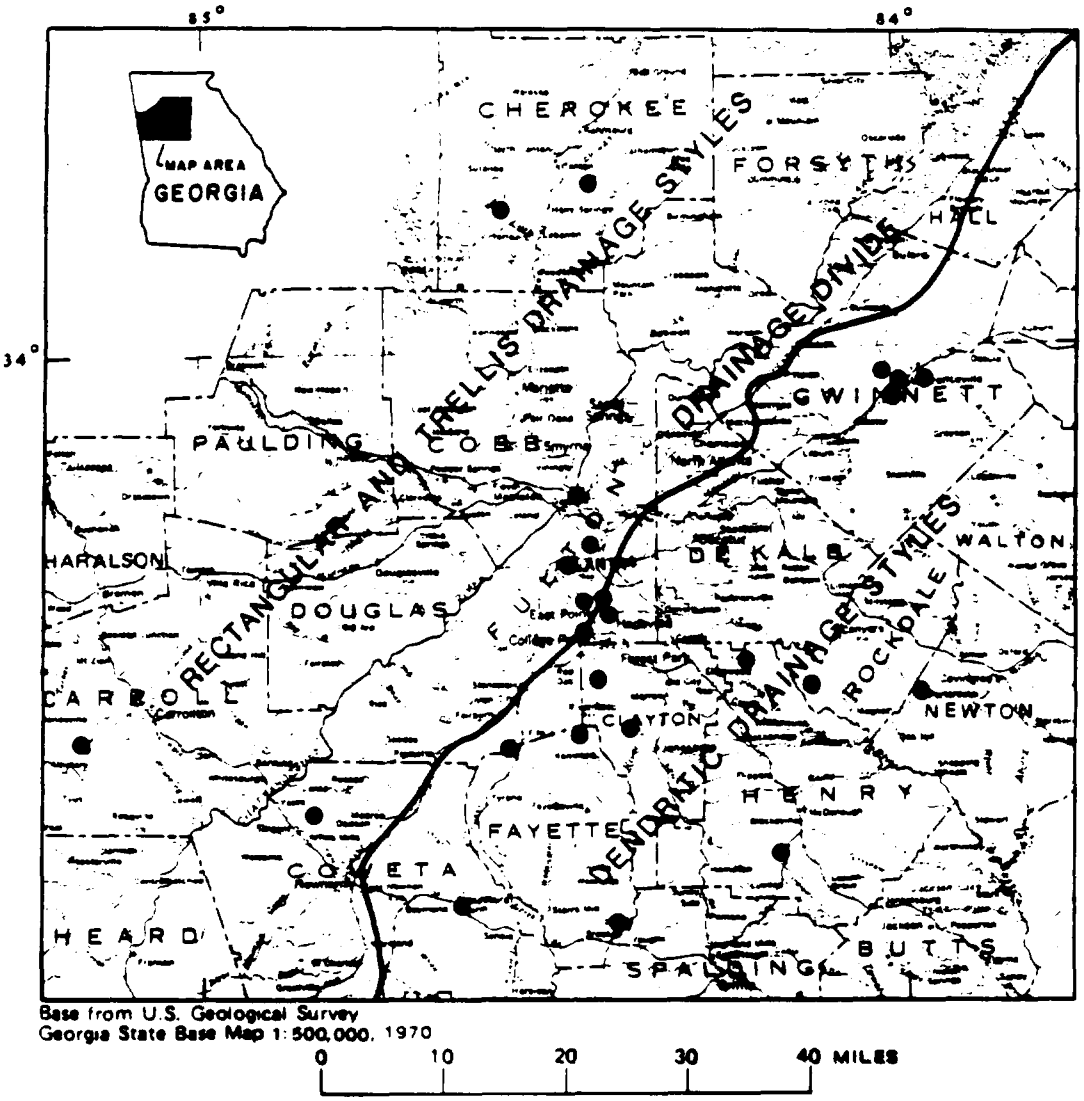

Figure 11. Locations of bottom-hole fracture wells.

obtained a large yield from one or two openings at depth. According to the memories of their owners and drillers, these wells derived their entire yields from one or two openings at or very near the bottom of the holes. The writers believe these wells also are bottom-hole fracture wells that derive water from stress relief fractures, but they were omitted from the table because no written records of the wells were available.

Areal Extent of Stress Relief Fractures

No practical means was found to measure the areal extent of stress relief fractures. Conyers well 13DD56, which is 410 ft deep and supplies 348 gal/min, is known to be connected with a 470-foot deep residential well about 400 ft to the north-northeast. The connection between the two wells was discovered when compressed air used to drill the residential well began escaping from the Conyers well.

Well 13DD90, about 2 miles southwest of Conyers, which derives water from horizontal fractures, is affected by wells 300 and 600 ft to the south, and seems to interfere with a well about 1,000 ft to the west. Conyers wells 13DD54 and 13DD55, on the other hand, are about 1,500 ft apart and tap separate horizontal fractures.

The spacing of these and other wells indicates that horizontal stress relief fractures probably range from as little as 100 ft to more than 1,000 ft across. The areal extent of individual fractures may be controlled by rock type, the size of the rock body, the geologic structure, and the amount of overburden removed relative to the area of the fracture.

Locating Horizontal Stress Relief Fractures

Because of their horizontal nature and the fact that they occur mainly at depths of 150 to more than 600 ft, stress relief fractures are not revealed by structural and stratigraphic features normally associated with increased bedrock permeability. The only clue to their presence, recognized thus far, is topographi setting. Although wells tapping horizontal fractures occupy a variety of topographic settings ranging from ridg crests to broad stream valleys, a larg percentage of the wells occur in thre rather distinct types of topographic settings. A knowledge of these settings ma aid in selecting sites for high-yieldin wells in areas having horizonta fractures.

The types of topographic settings are

A. Points of land formed by (1) tw streams converging at acute angles (fig 12B, C), (2) two subparallel tributarie entering a large stream (fig. 12A, D) and (3) land protruding into the wid flood plains of large streams (fig. 12E) In 1 and 2, the points of land generall are less than 2,000 ft across.

B. Broad, relatively flat ridg areas, commonly on divide ridges, tha are surrounded by stream heads (figs. 1 and 14). The wells are on the ridg crests and in the upper reaches c streams flowing off the ridges. Suc areas are the sites of many towns ar communities and, therefore, are cente of municipal and industrial pumpage.

C. Broad valleys formed by the r moval of large volumes of material rel tive to the land on either side (fi 28).

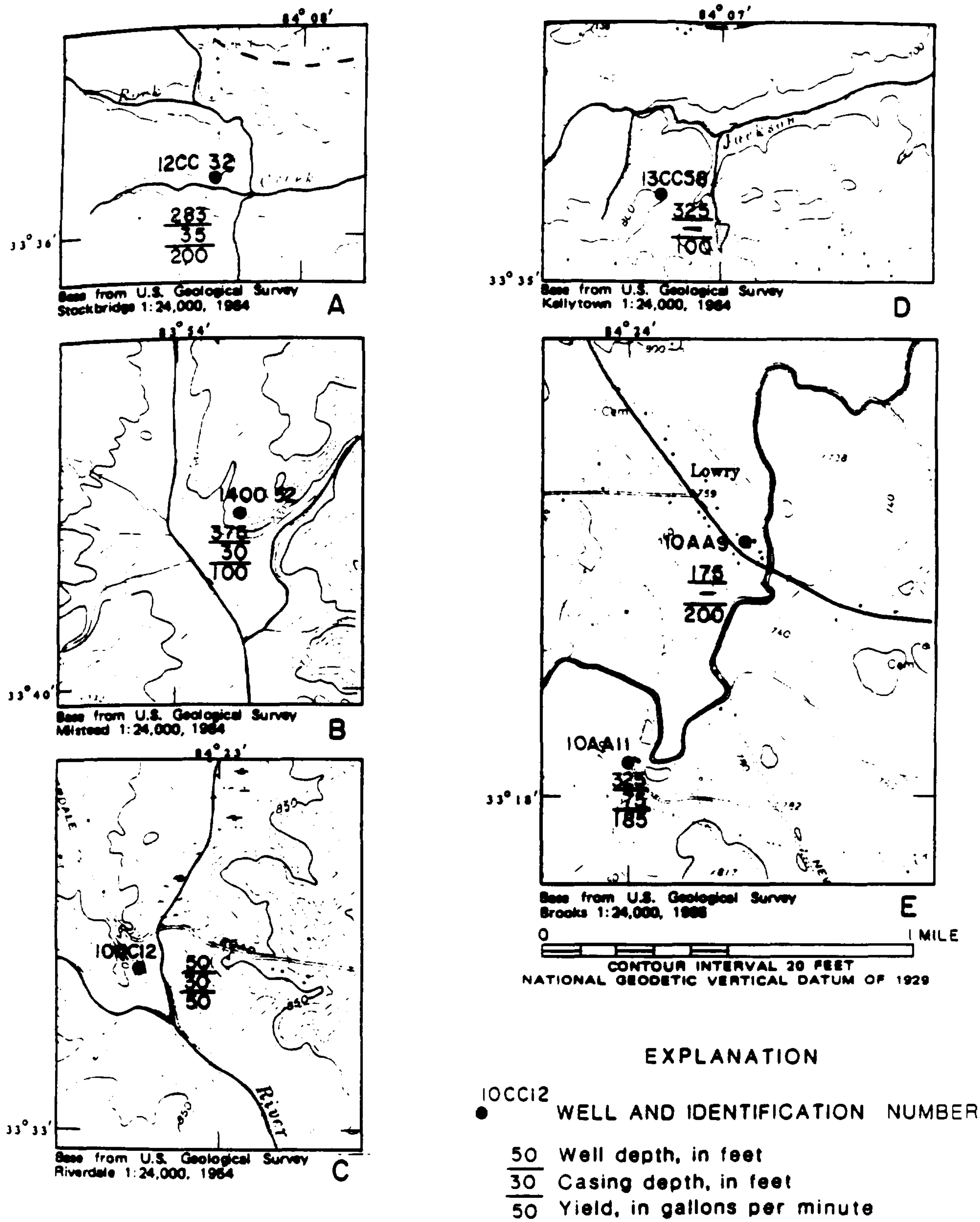

Figure 12. Wells tapping horizontal fractures commonly occupy points of land formed by confluent streams or projections of land that form constrictions in the broad flood plains of large streams.

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The types of topographic settings are:

A. Points of land formed by (1) two streams converging at acute angles (fig. 12B, C), (2) two subparallel tributaries entering a large stream (fig. 12A, D), and (3) land protruding into the wide flood plains of large streams (fig. 12E). In 1 and 2, the points of land generally are less than 2,000 ft across.

B. Broad, relatively flat ridge areas, commonly on divide ridges, that are surrounded by stream heads (figs. 13 and 14). The wells are on the ridge crests and in the upper reaches of streams flowing off the ridges. Such areas are the sites of many towns and communities and, therefore, are centers of municipal and industrial pumpage.

C. Broad valleys formed by the removal of large volumes of material relative to the land on either side (fig. 28).

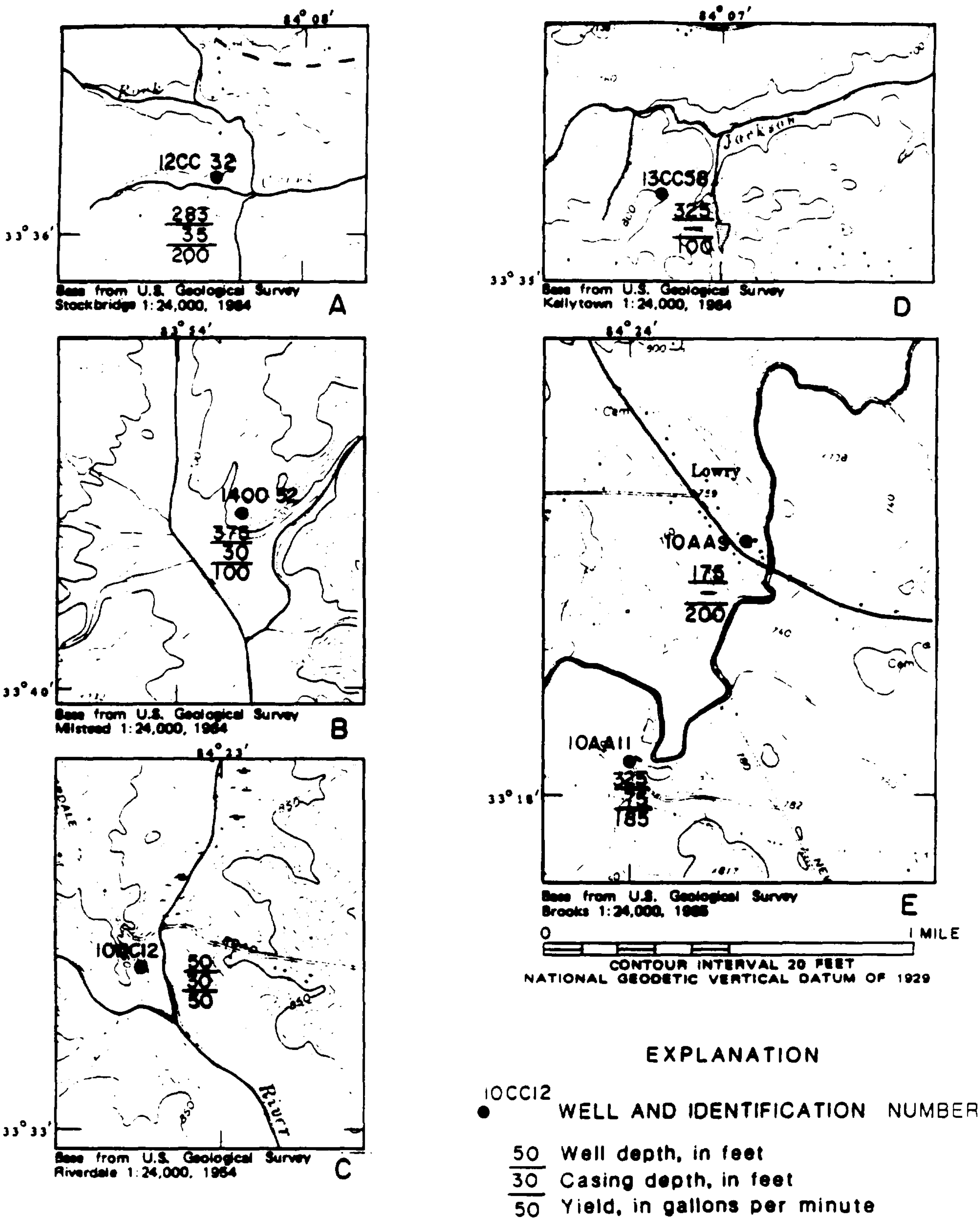
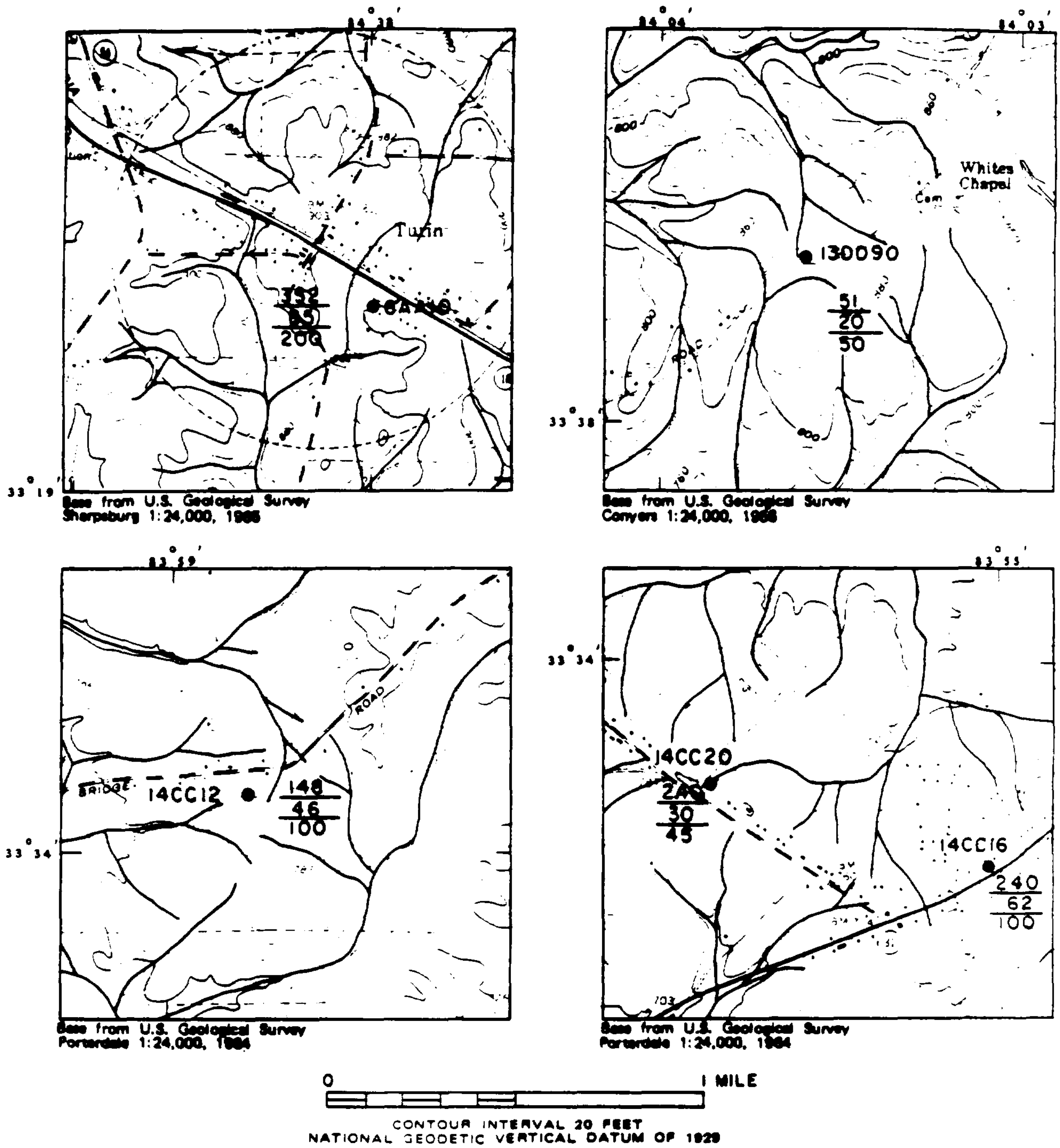


Figure 12. Wells tapping horizontal fractures commonly occupy points of land formed by confluent streams or projections of land that form constrictions in the broad flood plains of large streams.

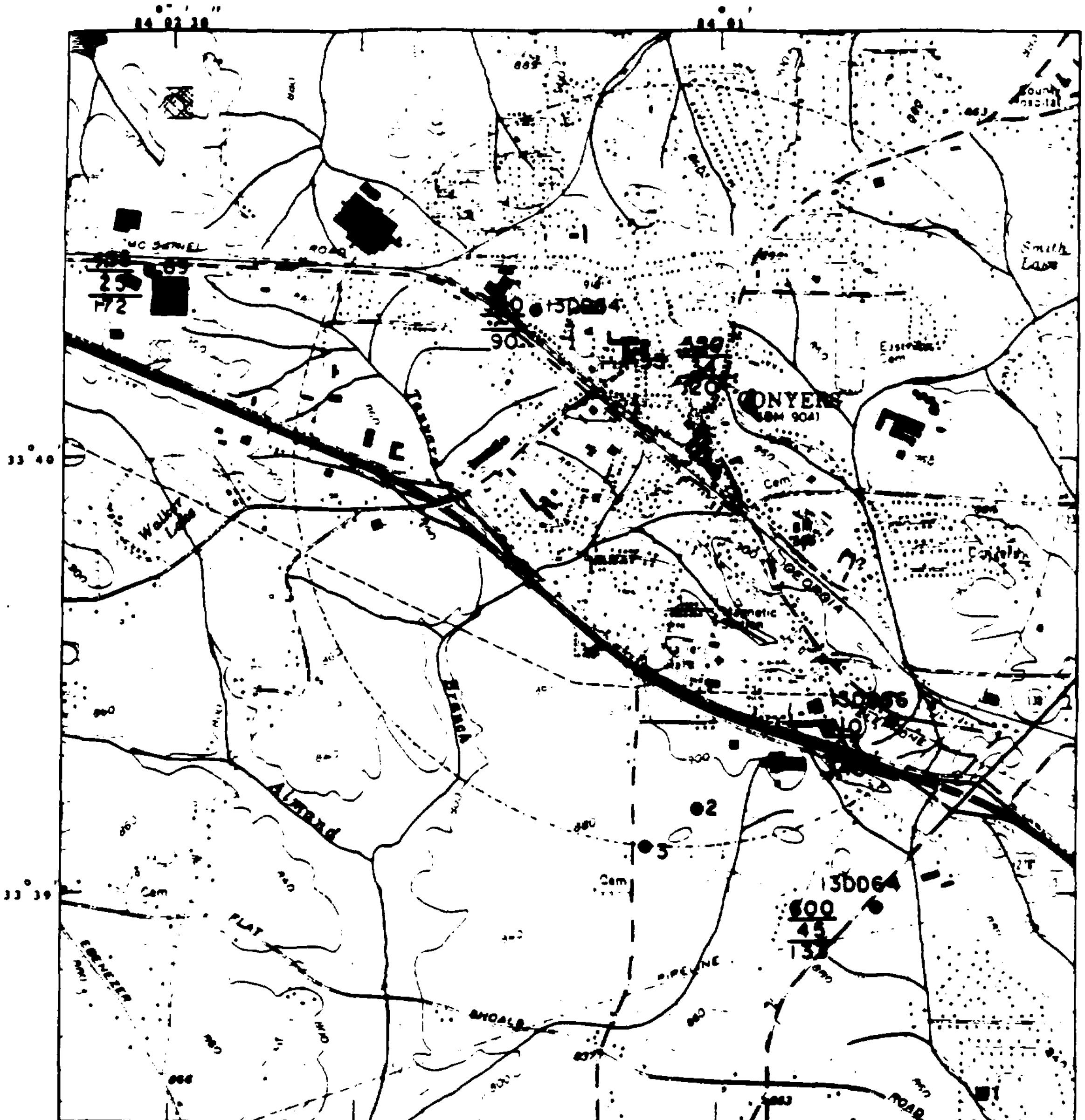


EXPLANATION

● 14CC16 WELL AND IDENTIFICATION NUMBER

240	Well depth, in feet
62	Casing depth, in feet
100	Yield, in gallons per minute

Figure 13. High-yielding wells commonly tap horizontal fractures on rid[illegible] [illegible]p- land areas surrounded by stream heads.



Base from U.S. Geological Survey
Conyers 1:24,000, 1968

0 — 1 MILE

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

● 13D064 WELL AND IDENTIFICATION NUMBER

600 Well depth, in feet
45 Casing depth, in feet
133 Yield, in gallons per minute

Figure 14. Wells tapping horizontal fractures commonly are on divide ridges s… rounded by stream heads or in the upper reaches of streams flowing divide ridges, as in the Conyers area, Rockdale County. Wells 1, … and 3, each 600 feet deep, are dry.

Zones of Fracture Concentration

Aquifers of low to moderate productivity may yield large quantities of water to wells from localized zones of increased porosity and permeability created by the concentration of fractures. These zones of fracture concentration generally are between 30 and 200 ft wide, along which the bedrock is shattered to an indefinite depth by numerous, nearly vertical, closely spaced fractures or faults of small displacement that are alined approximately parallel to the long axis of the fracture zone (fig. 15). The zones of fracture concentration extend in straight or slightly curved lines that range in length from a few hundred feet to several miles. Straight or slightly curved linear features a mile or more long, associated with these fracture zones, are visible on aerial photographs and topographic maps and are known as lineaments; shorter features are called linears.

Zones of fracture concentration tend to localize valley development. Rock weathering is greatest along these frac ture zones because they transmit larg quantities of moving water. The in creased chemical weathering, coupled wit the erosive action of surface water localizes the valleys over these fractu zones (fig. 16). The chances of obtair ing a high-yielding well are good in th floors of valleys developed over a frac ture zone (Parizek, 1971, p. 28-56).

Valleys developed over fracture zone commonly possess distinctive characteri tics that make them recognizable on topo graphic maps, aerial photographs, ar satellite imagery. Among the feature most easily recognized are: (1) straig stream and valley segments, (2) abrup angular changes in valley alinement, ar (3) alinement of gullies, small depre sions, or sinkholes (in marble).

In the GAR, zones of fracture conce tration have localized valley developme mainly in the north part of the ar where topographic features develop

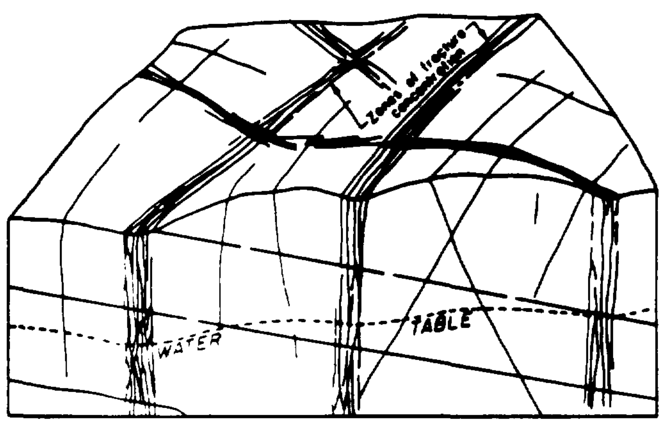


Figure 15. Zones of fracture concentration consist of nearly vertical closely spaced fractures. Modified from Parizek (1971).

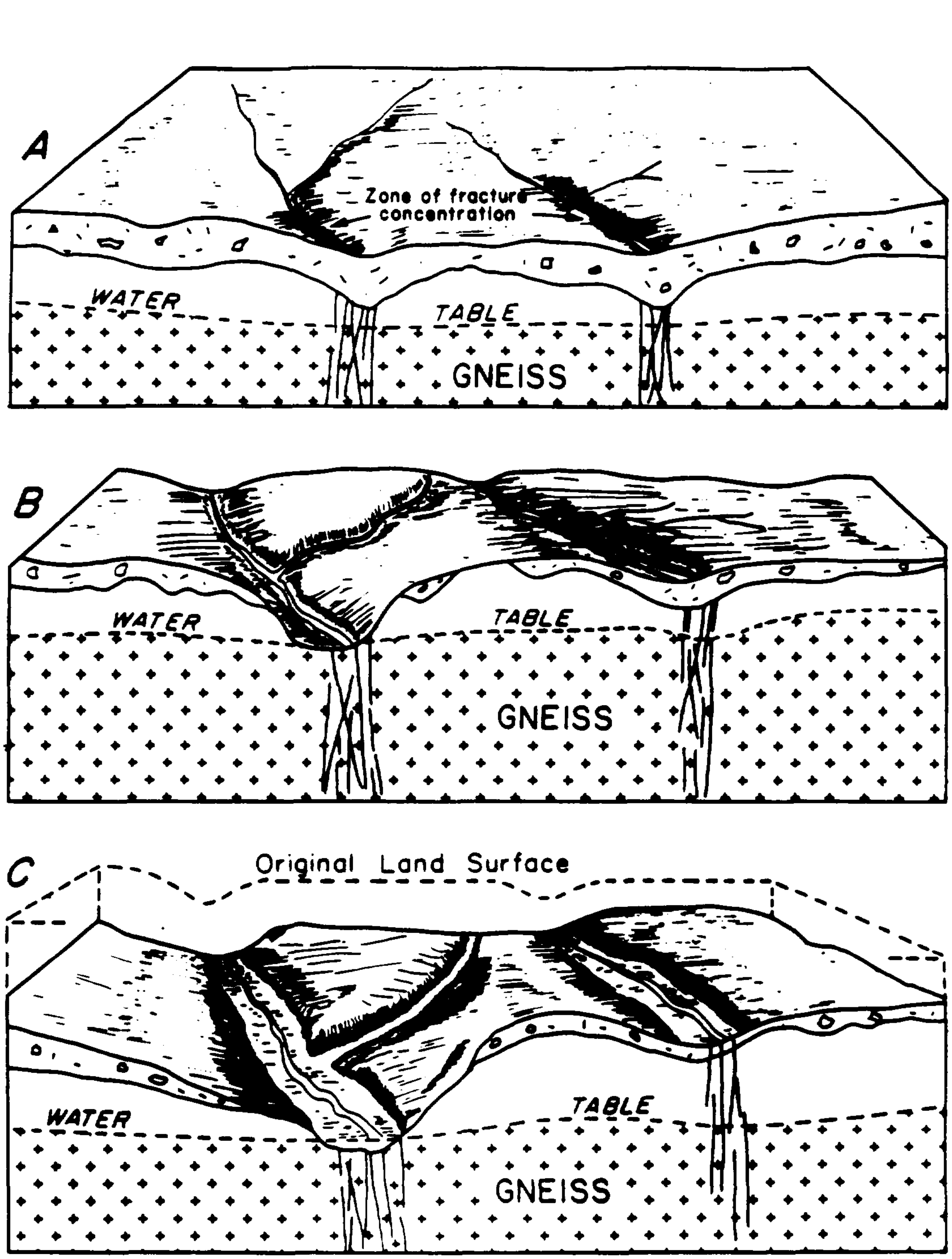


Figure 16. Valley development localized along zones of fracture concentration. Modified from Parizek (1971).

under geologic control. Several high-yielding wells in the north part of the area occupy sites on the floors of straight stream valleys that seem to have developed over fracture zones.

For example, the water supply for the Lake Arrowhead resort community, in northwest Cherokee County, was successfully developed in rugged terrain characterized by generally low-yielding wells, by drilling into zones of fracture concentration. Six production wells that penetrate zones of fracture concentration supply a combined total yield of about 560 gal/min. Driller's logs revealed that all of the wells having yields between 50 and 200 gal/min penetrated sizable fracture systems consisting of one or more large fractures or zones of closely spaced fractures. The largest yields came from zones of closely spaced fractures.

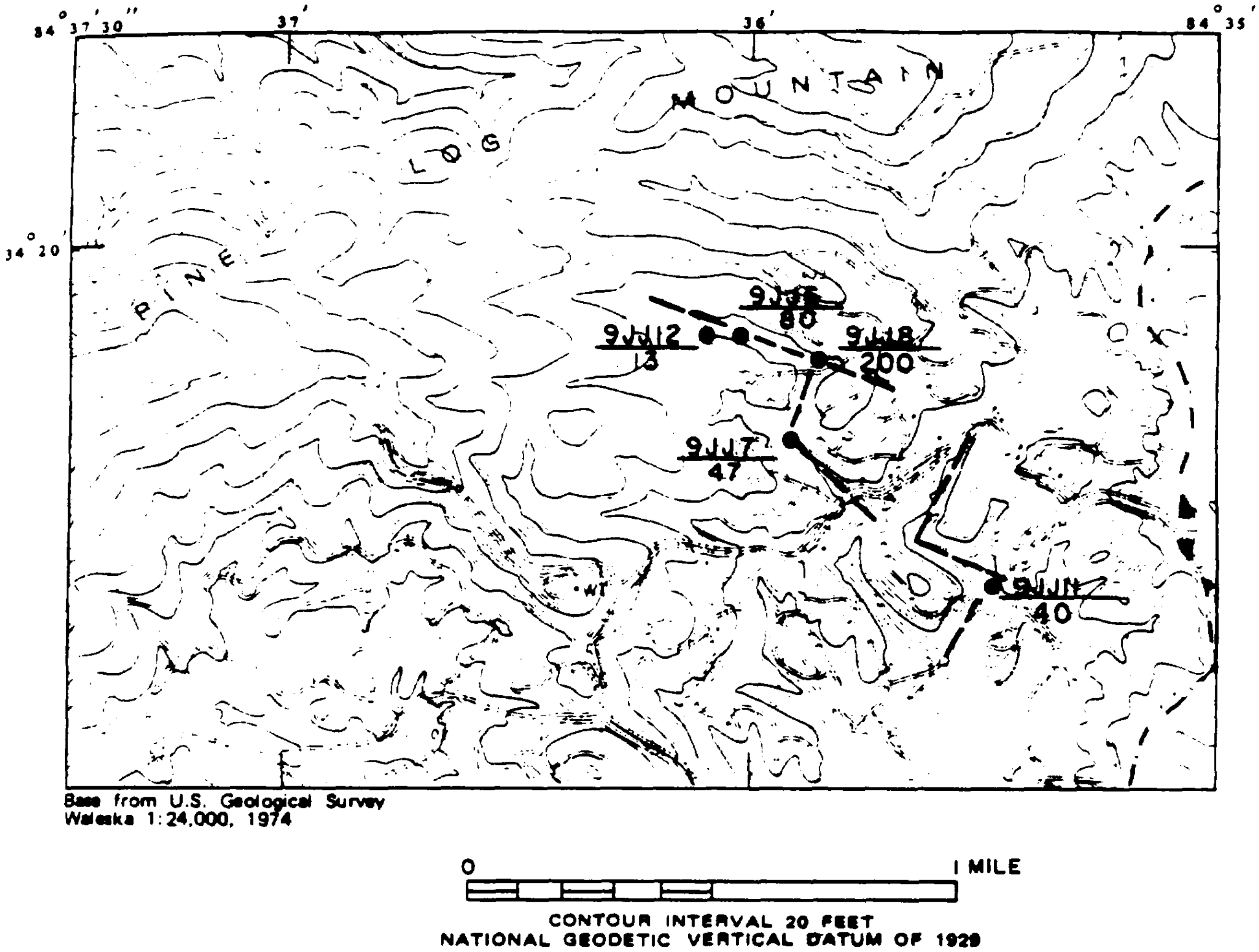
All the high-yielding wells occupy sites along straight stream segments, or where valleys make abrupt, angular changes in direction. Figure 17 is a map of part of the Lake Arrowhead area showing the locations of high-yielding and low-yielding wells, to illustrate how yields relate to topographic settings. All of the high-yielding wells are in settings that strongly suggest the presence of zones of fracture concentration.

As most zones of fracture concentration are rather narrow--30 to 200 ft wide --precision in locating wells was required to insure penetration of the water-bearing fractures. For example, wells 9JJ6 and 9JJ8 penetrated a fracture zone and yielded 80 and 200 gal/min, whereas well 9JJ12, which is situated slightly off the fracture zone, penetrated mainly solid rock and yielded only 13 gal/min.

Valleys possessing the distinctive characteristics of those developed over zones of fracture concentration--straight stream and valley segments; abrupt, angular changes in valley alinement; and alinement of gulleys, small depression and gaps in ridges--are common in t north part of the GAR. Many of the features overlie permeable fracture zon and may be capable of supplying lar yields to wells. For example, wel 11GG11 and 11GG12 in Forsyth County ea supply 200 gal/min from a fracture zo in amphibolite of water-bearing Unit The fracture zone, which runs at near right angles to the strike of the roc underlies two straight stream segmen that are alined with a gap in the inte vening ridge (fig. 18). Numero straight stream segments of similar cha acter occur in the north part of the ar and may supply large quantities of wat to wells.

Field investigations showed, howeve that not all linear features in the nor part of the area overlie permeable fra ture zones. Several straight stream a valley segments in the Sweetwater Cre area of Douglas County were found to on rock having an average spacing joints and fractures. None of the va leys was found to be associated with zone of fracture concentration. Poss bly, these valleys were localized ov fracture zones that subsequently erod away, leaving rock of average permeabi ity. Depending on the depth of so cover and the amount of rock exposed, may not be possible to verify the pre ence of concentrated fractures by fie examination.

Zones of fracture concentration al occur in the south half of the area, b all that were identified in the fie occupied hills and ridges and were n associated with valley development. T superimposed dendritic drainage in th part of the area seems to have great limited the localization of valleys zones of fracture concentration. Valle localized over fracture zones may be li ited to the headwaters areas of drainag where stream courses, draws, ... depressions were formed after ... any preexisting cover and dr... established under geologic c... Th

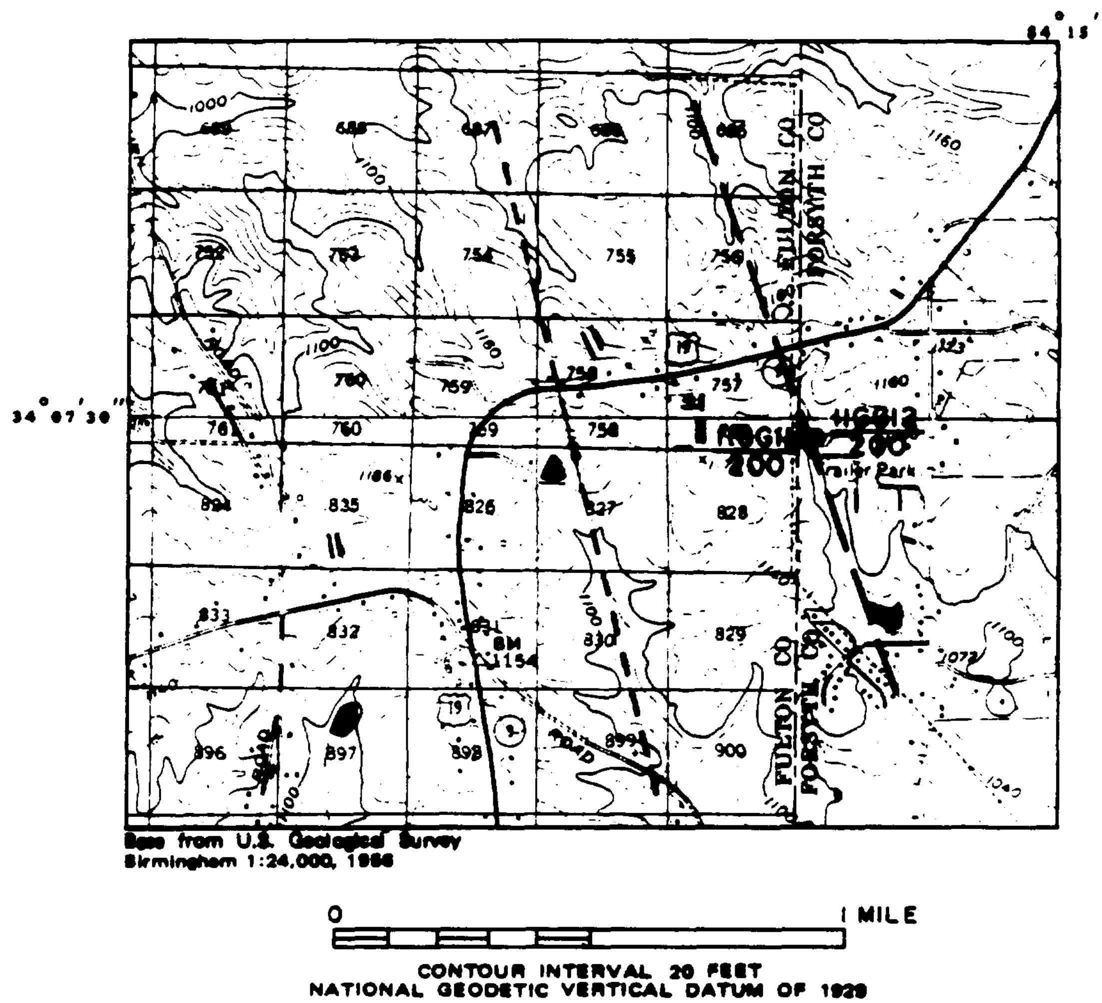


EXPLANATION

— — — ZONE OF FRACTURE CONCENTRATION

9JJ11 / 40 WELL-Top number is well identification. Bottom number indicates yield, in gallons per minute.

Figure 17. Relation of zones of fracture concentration to well yields, Lake Arrowhead area, Cherokee County. Modified from Cressler and others (1979).



EXPLANATION

— — ZONE OF FRACTURE CONCENTRATION

– – – – PROBABLE ZONE OF FRACTURE CONCENTRATION

● $\frac{11GG11}{200}$ WELL-Top number is well identification. Bottom number indicates yield, in gallons per minute.

Figure 18. Permeable zones of fracture concentration commonly lie along straight valley segments that aline with gaps in ridges.

may explain why most high-yielding wells in the south part of the area that occupy valley settings are in headwaters areas.

Early in the study the writers observed that many straight stream and valley segments in the south half of the area have a persistent strike of N. 35°-40° W. Near Milstead in Rockdale County, several linear valleys having this strike are coincident with or closely associated with diabase dikes. Southwest of Atlanta, between Forest Park and Newnan, several straight stream and valley segments also strike N. 35°-40° W., but are not associated with diabase dikes. Because of their nearly identical strike with the dikes, the writers considered the possibility that these valley segments could have developed along the same system of tension joints that was intruded by the diabase to the east and, therefore, could overlie zones of increased permeability. A test well was drilled in a linear valley formed by a segment of Camp Creek south of Riverdale, Clayton County (fig. 19), to check bedrock permeability. The well, which is 600 ft deep, penetrated nearly solid gneiss and schist (Unit A) and yielded less than 10 gal/min. The results of this test provided the first hard evidence that these linear valleys were not localized over zones of fracture concentration and that their common strike was not a product of geologic control. This raised the question: could the parallel streams in the area having a common strike be a product of dendritic drainage?

In an attempt to answer this question, topographic maps of parts of the Georgia Coastal Plain were examined to see whether in other areas of dendritic drainage, streams assume parallel courses and maintain a similar strike over large areas. The maps showed that in the Coastal Plain, streams have a common tendency to form several straight valley segments that follow essentially parallel courses. Thus, the parallelism of several straight valley segments in the south half of the GAR seems to be a normal development of dentritic drainage style and may not be related to bedrock permeability.

Small-Scale Structures that Localize Drainage Development

Small-scale structures that localize drainage development play a major role in determining the availability of ground water. The structures include joints, bedding or compositional layering, foliation, cleavage, and the axial planes of small folds. Such structures represent inhomogeneity in rocks and form planes of weakness that enhance the rapidity and depth of weathering, bringing about increases in permeability.

Rocks generally are more permeable in directions parallel to these structures than across them. Preferential permeability in weathered schists and foliated rocks has been documented by Stewart (1964) and was observed during this study. (See section on contact zones under "Availability", this report.) As rocks weather, water moves through planar openings and establishes paths of circulation that increase the rate and depth of weathering. Weathering progresses rapidly and deeply along planes of bedrock weakness, tending to localize drainage development in much the same way as discussed for zones of fracture concentration.

Where small-scale structures underlie and trend parallel to stream valleys, drainages, and draws that concentrate the flow of water, they can be avenues of greatly increased permeability. Wells drilled into drainages that flow parallel to structural features in the underlying bedrock commonly supply large yields. Relating small-scale structures to the topography and drainage is a very successful method of selecting high-yielding well sites.

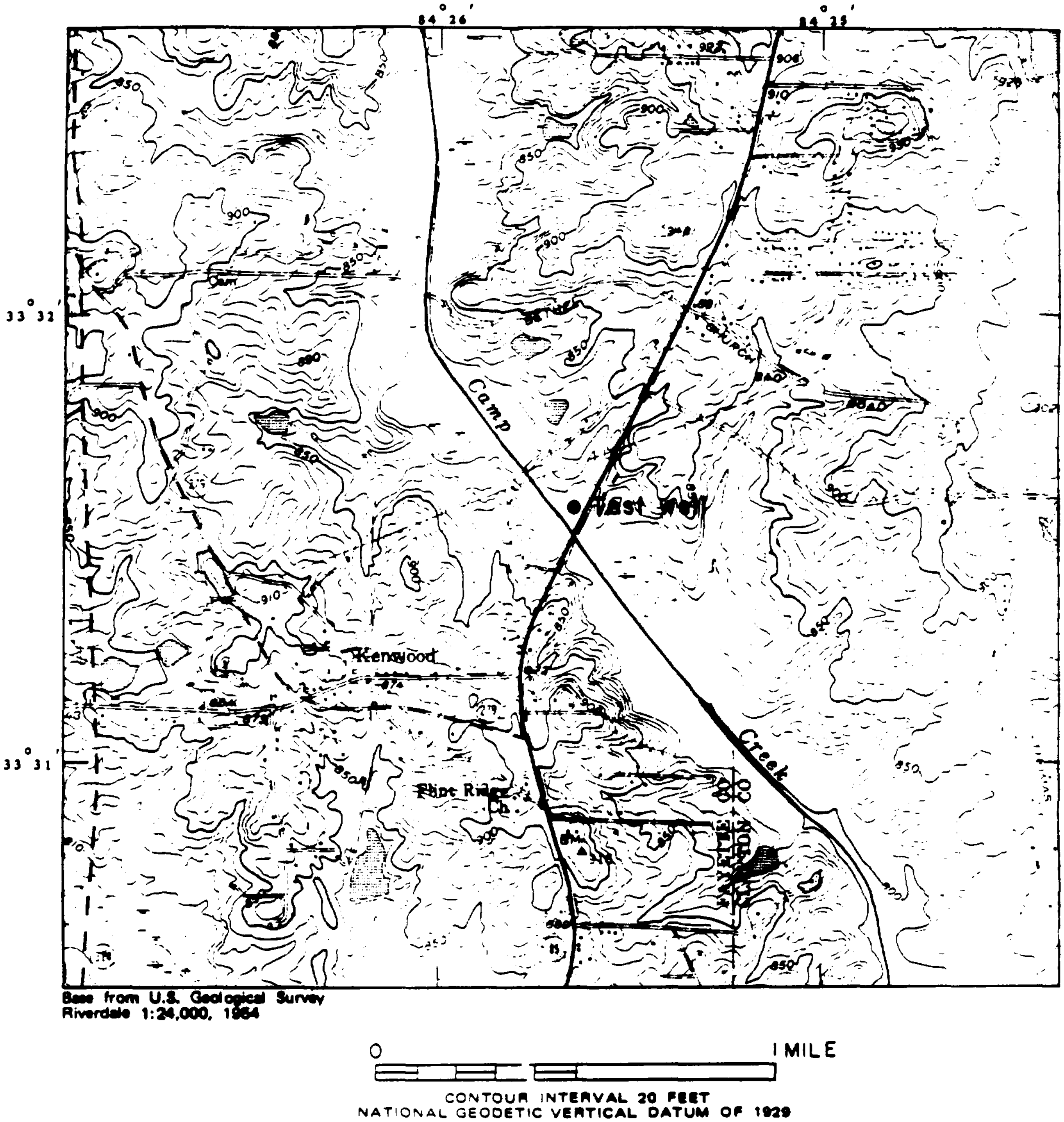


Figure 19. Topographic setting of the test well drilled in the linear valley formed by a segment of Camp Creek south of Riverdale, Clayton County.

Because small-scale structural features must localize drainage development in order to bring about significant increases in permeability, they are most useful in the north half of the report area where streams have developed under geologic control. They also may be useful in headwaters areas in the south.

In the south half of the report area, some high-yielding wells are obtained by drilling in small draws and drainages in the headwaters areas of large streams. Commonly, where wells on hilltops and ridge crests furnished insufficient yields, successful wells resulted from moving to sites in the nearest draw or headwater drainage. Because these uppermost drainages formed after removal of any preexisting cover, their locations have been influenced by the underlying bedrock structure and, therefore, they occupy relatively permeable zones.

Folds

Rocks in the GAR were too ductile during periods of major deformation to develop open joints. The latest two fold sets, however, occurred after the rocks cooled and were under less pressure, producing open joints that are concentrated along the fold axes (Michael W. Higgins, U.S. Geological Survey, oral commun., 1981). The folds, which are east-west and north-south trending open folds ranging from less than 75 to more than 600 ft across, are recognizable in road cuts and quarries (fig. 20), from where they can be projected into low areas favoring deep weathering and increased recharge. In the absence of more productive features, concentrations of joints along fold axes in the right topographic settings may be capable of supplying large well yields.

Shear Zones

The Geologic Map of Georgia (Georgia Geological Survey, 1976) shows a number of major shear zones south and southeast of Atlanta, in northern Spalding County and in Rockdale, Newton, and Walton Counties (plate 1). In relating well locations and yields to geology and structure, some of the highest yielding wells (100 gal/min to more than 200 gal/min) were found to be in these and other shear zones. Driller's logs of some of these wells report "broken rock" and "flint rock" in the wells, indicating that the wells penetrate shear zones. Other high-yielding wells are near shear zones and also penetrate permeable rock, although details about the type of rock penetrated were unavailable.

Many of the shear zones strike northeast and dip steeply to the southeast. They vary in length from less than 1 mile to about 7 miles. Although the geologic map shows shear zones to be continuous, field observations indicate that the longer shears may consist of a series of discontinuous zones that trend nearly parallel. The shear zones form prominent topographic lineaments and linears, generally consisting of low, narrow ridges flanking long, fairly straight valleys. The lineaments can be traced for miles in the field and are readily visible on topographic maps. Thicknesses of the shear zones are unknown, but the width of the associated valleys indicates that they may be as much as several hundred feet thick.

The shear zones occur in a variety of rock types, though most are in granitic gneiss (Unit B). The sheared rock consists of two types: flinty crush rock and sheared country rock.

The flinty crush rock is light-tan or buff colored, is very fine grained to cryptocrystalline, and breaks into small angular blocks. In hand samples it is easily distinguished from vein quartz. The more intensely sheared flinty crush rock weathers to small, flat, diamond-shaped pieces produced by intersecting shear planes. This is the single most consistent feature found in nearly all of the shear zones. Buff-colored flinty crush rock most commonly is associated with felsic granites and gra[illegible]

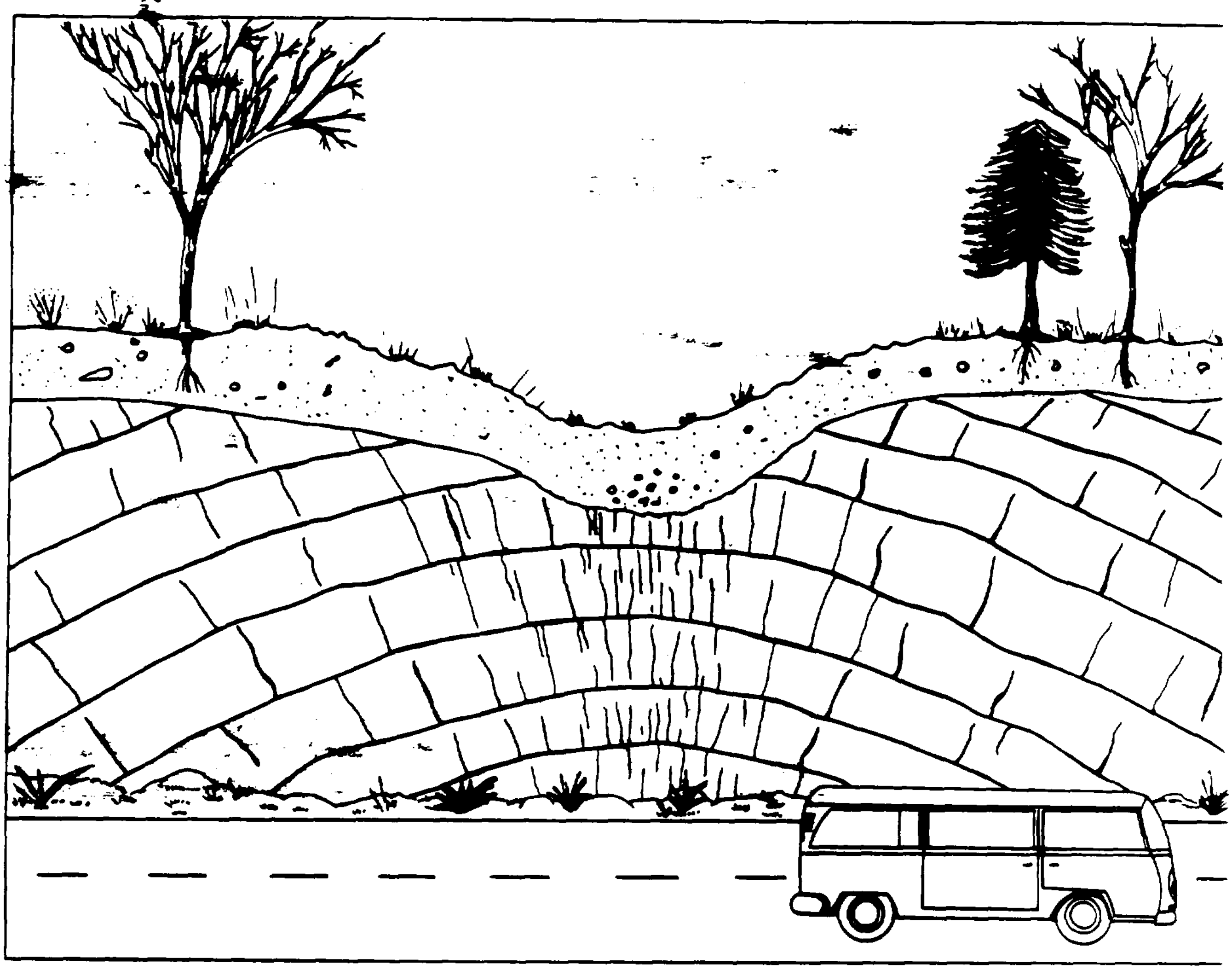


Figure 20. Concentrated jointing **along the axis of a** late fold.

gneisses. Dark-gray to black flinty crush rock occurs in association with more mafic rocks, such as diabase.

The sheared country rock generally shows little or no replacement mineralization. Shearing of biotite-rich gneisses commonly results in a rock having a schistose texture containing a large proportion of platy minerals (muscovite or biotite). Sheared amphibolites retain the same mineralogy but undergo abrupt textural changes that produce the previously mentioned diamond-shaped fragments. Schist that has been sheared may weather into small disk-shaped pieces and is referred to as "button schist."

HIGH-YIELDING WELLS

In this report, the term "high-yielding wells" refers to ones that supply a minimum of 20 gal/min, except in the belt extending from College Park through Atlanta, where the minimum yield is 50 gal/min. The maximum yields of the wells range from 35 to 470 gal/min, the wide range in yields resulting from differences in rock type, geologic structure, and topographic settings. The distribution of high-yielding wells in the report area is shown on plate 1.

Data on more than 1,500 high-yielding wells in the GAR were obtained from files of the U.S. Geological Survey, local drilling contractors, and ground-water hydrologists, and from previous publications. The location of each high-yielding well used in this report was confirmed by field checking and plotted on topographic maps for determination of latitude, longitude, and topographic setting. Construction and yield data were confirmed, where possible, by interviews with well owners. About 400 reportedly high-yielding wells were excluded from use in this report because the wells could not be located within the alloted time or significant questions remained about the accuracy of yield or construction data.

SELECTING SITES FOR HIGH-YIELDING WELLS

Selecting sites for high-yielding wells requires a knowledge of the character of the underlying bedrock, the structural and stratigraphic features present, and the relation of these features to the topography and drainage. This knowledge generally is obtained by a foot traverse of the area, during which structural and stratigraphic features such as fault zones, contact zones, zones of fracture concentration, the dip and strike of foliation and layering, the strike and plunge of fold axes; and other clues to localized increases in bedrock permeability are plotted on a topographic map. Locating observed features on a topographic map is a good way to understand their relation to the topography and drainage.

The appropriate method(s) to use for selecting high-yielding well sites depends on (1) the quantity of water needed, (2) the topography and the drainage style of the area, (3) the rock type, (4) the types and character of structural and stratigraphic features present in the rock, and (5) imposed constraints, such as being limited to a small area or to specific pieces of property, or the requirement that the sites be near pipelines or other facilities. Site selection methods that can be applied to most combinations of geology, topography, and drainage are presented below.

The reader also should understand that the successful siting of high-yielding wells in the GAR is not particularly good. Drilling of multiple wells to obtain required yields is common. [illegible]so, it should be recognized that some [illegible]s, for practical purposes, are vir[illegible] "barren" of ground water.

Topography and Soil Thickne[illegible]

Because the yields of individ[illegible] in the GAR vary greatly within sh[illegible] tances, estimating the potential [illegible] prospective sites can be very di[illegible].

Most methods for selecting well sites require a knowledge of geology and structure, which restricts their use primarily to hydrologists. A method was developed by LeGrand (1967) that utilizes only topography and soil thickness, and is suitable for use by nonhydrologists. The method provides a means for estimating, on a percentage basis, the chances of obtaining certain yields from prospective well sites in a variety of settings.

The LeGrand Method

"Although many factors determine the yield of a well, two ground conditions when used together serve as a good index for rating a well site. These conditions are topography and soil thickness. The ratings are based on the following statement: High-yielding wells are common where thick residual soils and relatively low topographic areas are combined, and low-yielding wells are common where thin soils and hilltops are combined. By comparing conditions of a site according to the topographic and soil conditions one gets a relative rating value. For example, the following topographic conditions are assigned point values:

Points	Topography
0	Steep ridge top
2	Upland steep slope
4	Pronounced rounded upland
5	Midpoint ridge slope
7	Gentle upland slope
8	Broad flat upland
9	Lower part of upland slope
12	Valley bottom or flood plain
15	Draw in narrow catchment area
18	Draw in large catchment area

"Figure 21 shows values for certain topographic conditions. Figure 22 shows rating values for soil thickness. The soil zone in this report includes the normal soils and also the relatively soft or weathered rock. The topographic and soil conditions are separately rated, and the points for each are added to get the total points which may be used in table 5 to rate a site.

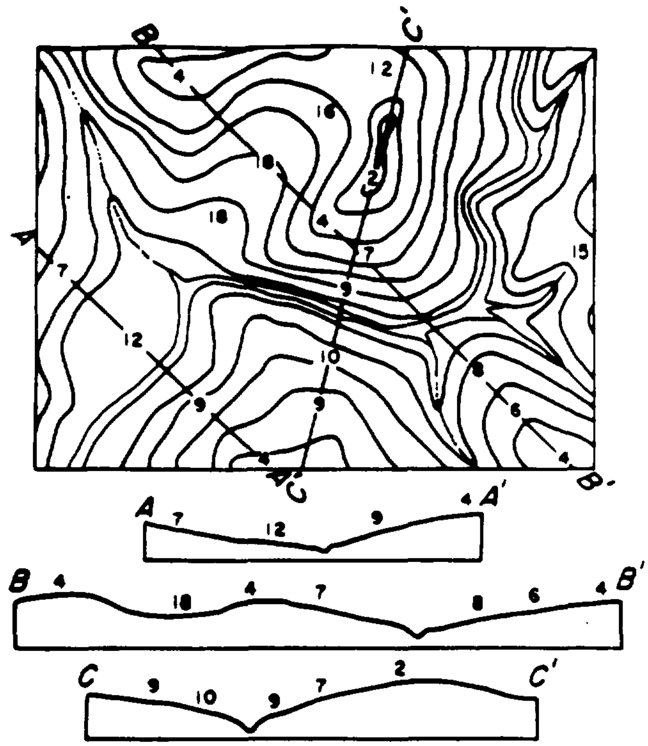


Figure 21. Topographic map and profiles of ground surface showing rating in points for various topographic positions. (LeGrand, 1967).

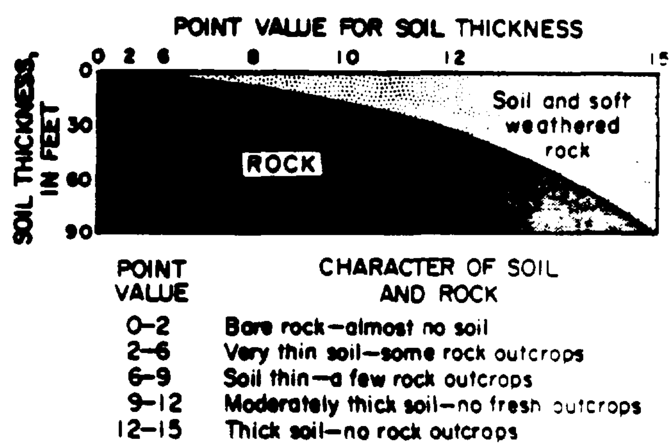


Figure 22. Rating in points for various conditions of soil thickness (LeGrand, 1967).

Table 5.—Use of numerical rating of well site to estimate the percent chance of success of a well (LeGrand, 1967)

[Data are based on maximum depth of 300 feet or maximum drawdown of water level of about 200 feet. No interference is assumed. Numberical rating is obtained by adding rating in points for topography and soil thickness; gpm, gallons per minute.]

Total points of a site	Average yield (gpm)	Chance of success, in percent, for a well to yield at least—				
		3 gpm	10 gpm	25 gpm	50 gpm	75 gpm
5	2	48	18	6	2	—
6	3	50	20	7	3	—
7	3	55	25	8	3	—
8	4	55	30	11	3	—
9	5	60	35	12	4	—
10	6	65	40	15	5	—
11	7	70	43	19	7	—
12	9	73	46	22	10	—
13	11	77	50	26	12	—
14	12	80	52	30	14	—
15	14	83	54	33	16	—
16	16	85	57	36	18	—
17	17	86	60	40	20	12
18	20	87	63	45	24	15
19	23	88	66	50	25	18
20	26	89	70	52	27	20
21	28	90	72	54	30	22
22	31	91	74	56	35	24
23	34	92	76	58	38	26
24	37	92	78	60	40	29
25	39	93	80	62	43	32
26	41	93	81	64	46	36
27	43	94	82	66	48	40
28	45	95	83	68	50	42
29	46	95	84	71	53	44
30	50	96	87	73	56	47
30+	50	97	91	75	60	50

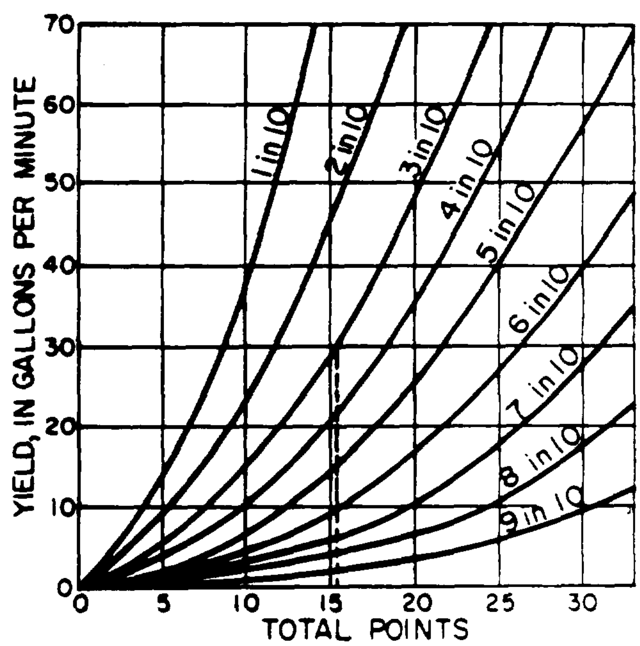
"Using two wells sites, A and B as examples, we can evaluate each as to the potential yield of a well. Site A, a pronounced rounded upland (4-point rating for topography in fig. 21) having a relatively thin soil (6-point rating for soil characteristics in fig. 22), has a total of 10 points. In table 5 the average yield for site A is 6 gal/min. This site has a 65-percent chance of yielding 3 gal/min and a 40-percent chance of yielding 10 gal/min. Site B, a draw or slight sag in topography (18-point rating) having a moderately thick soil (12-point rating), has a total of 30 points, an average yield of 50 gal/min, and a 73-percent chance of yielding 25 gal/min. Referring to figure 23, we see that the 10-point site has less than 1 chance in 10 of yielding 40 gal/min, whereas the 30-point site has better than an even chance of yielding 40 gal/min.

"Some topographic conditions of the region and a few topographic ratings are shown in figure 24. Wells located on concave slopes are commonly more productive than wells on convex slopes or straight slopes. Broad but slightly concave slopes near saddles in gently rolling upland areas are especially good sites for potentially high-yielding wells. On the other hand, steep V-shaped valleys of the gully type may not be especially good sites, and they should be avoided if surface drainage near the well is so poor that contamination is possible.

"More difficulty is likely to occur in rating character of soil and rock than in rating topography. Everyone should be able to determine by observation if the soil is thin and if the soil is fairly thick (more than 10 soil and rock points), but the intermediate ratings are difficult to make. If the observer is unsure of the soil and rock rating above the 6-point (thin-soil) value, he may choose a 10-point value for the site with assurance that he is fairly correct. White quartz or flint is not considered a true rock in this report, because it persists in the soil zone; a quartz vein, in many cases, is considered to be a slightly favorable indication of a good well site.

"The numerical rating system is no intended to be precise. One person ma rate a particular site at 15 points whereas another person may rate it at 1 points; such a small difference in ratin would not be misleading. Almost every one's rating will be within 5 points o an average rating for a site."

Limitations.—LeGrand's method is espe cially well suited to the north half o the report area, where the topography an geology are closely related and the topo graphic setting and soil thickness ar indicative of bedrock permeability. I can be applied there in every type o topographic setting, from the smalles draws and drainages to the larger strea valleys. The use of LeGrand's metho should bring about a substantial increas in the percentage of high-yielding wells



EXAMPLE: A site with 16 points has 3 chances in 10 of yielding at least 30 gallons per minute and 6 chances in 10 of yielding 10 gallons per minute.

Figure 23. Probability of getting a certain yield from a well at different sites having various total-point ratings (LeGrand, 1967).

From LeGrand, 1967

Figure 24. **Countryside showing approximate ratings for topography.** Numbers refer to figure 22.

In the south half of the area, the method probably will be most reliable in the uppermost headwaters areas of streams and along draws and drainages that flow down ridge slopes. In these areas, high-yielding wells commonly result when a dry hole on a hilltop or ridge crest is abandoned in favor of a site in the nearest draw or saddle, or downslope midway between the hilltop and the draw. The larger superimposed streams and drainages are not necessarily located over zones of bedrock weakness and, therefore, the method may not be applicable in those areas.

Contact Zones Between Rock Units of Contrasting Character

Potentially permeable contact ... es between rock units of contrasting ... c- ter occur in the GAR wherever Unit ... , and F are in contact with Units A, ... E and in some areas with Unit G. ... contact zones between Unit C and ... , H, and G also may be permeable. ... contacts between these units are ...

plate 1. Additional contact zones between different rock types within individual units can be found on detailed geologic maps that are available for parts of the area. (See References.) Field surveys also may reveal contact zones between individual rock layers not shown on the geologic maps.

Identifying Contact Zones

Permeable contact zones form between rock units that respond differently to weathering, such as granite and schist, gneiss and feldspathic schist, and massive homogeneous rock and highly foliated rock. The greatest permeability may occur where resistant rock (massive granite or gneiss) is overlain by rapidly and deeply weathering rock (feldspathic schist). The more resistant rock may be characterized by fresh rock exposures and thin soil and may be somewhat higher topographically. The area underlain by the less resistant rock may lack exposures, have very deep soil, and be somewhat lower. Some contact zones occupy small linear depressions or show up as slight changes in slope between the two rock units. The contacts may follow small drainages or even streams, or they may cross drainages at various angles. Other contacts, particularly in the south half of the report area, have little if any surface expression and are visible mainly in road cuts and similar exposures.

Selecting Well Sites

High-yielding well sites should be selected so that the wells will penetrate contact zones at a depth of about 100 to 150 ft. Proper placement of the wells with respect to the dip of the contact zones is essential to avoid missing the zones completely or penetrating them at too great or too shallow a depth to obtain a large yield (fig. 25).

The largest yields to wells can expected where contact zones trend para lel to and underlie draws or drainag that are downgradient from sizable catc ment areas. Contact zones crossi broad, low areas covered by deep so also can supply large well yields. areas of poor exposure, it may be nece sary to project contact zones into sui able topographic settings in order select high-yielding well sites.

Area of Application

This method can be applied in most the north half of the report area whe drainage development and bedrock perm ability are related. In the south ha of the area, the method can best applied to headwaters areas and to drai ages and draws on the slopes of divi ridges. The development of these lat forming drainages probably followed t removal of any preexisting cover a thus, contact zones are more likely have influenced drainage development.

<u>Contact Zones in Multilayered Rock Units</u>

Permeable contact zones in multila ered rock units are most likely to occ where different rock types alternate layers a few feet to no more than a fe tens of feet thick. Rock layers of sui able type and thickness are present most areas underlain by Unit A and i some areas of Units C, D, E, and G. How ever, because the individual rock layer in these units are not shown on plate and generally are not shown on geologi maps, they must be located and checke for suitability by field surveys. I areas of poor exposure, it may [illegible] neces sary to determine the char[illegible]ter an thickness of the rock layer[illegible] roa cuts, quarries, and similar [illegible]res a project them along strike int[illegible]rabl topographic settings.

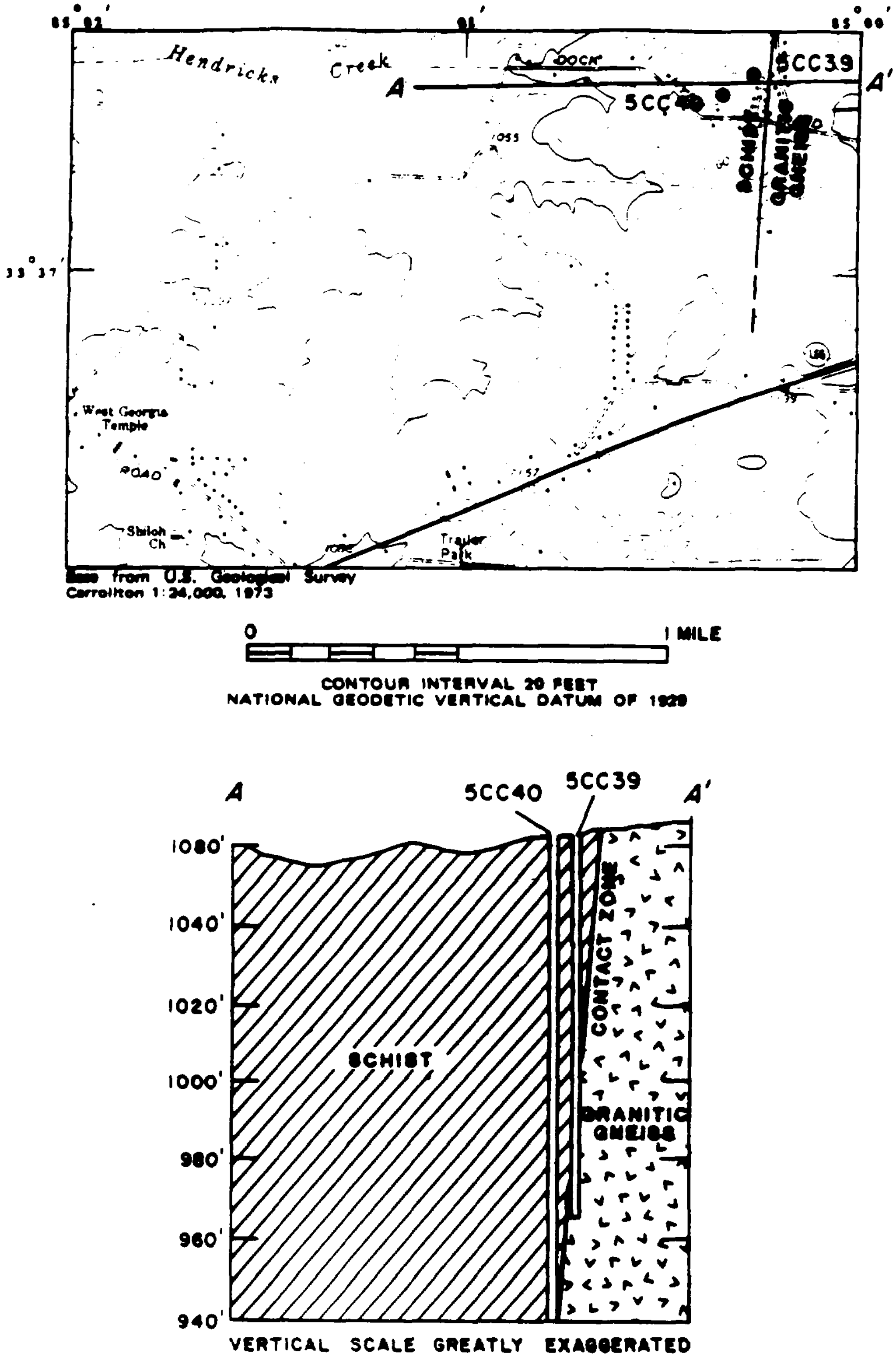


Figure 25. Well in contact zone between schist and granitic gneiss. Well 5CC39 yields 100 gallons per minute from the contact zone. Well 5CC40, which missed the contact zone, supplied about 1 gallon per minute.

Identifying Contact Zones

Contact zones capable of supplying large well yields generally form between rock layers that respond differently to weathering, such as gneiss, schist, and amphibolite (Unit A). Permeable contact zones also may form between layers of feldspathic schist and graywacke or quartzite in Unit C, between layers of schist or amphibolite and biotite gneiss in Unit D, and between different lithologies in Unit E. Increases in permeability generally are greatest in contacts that occupy topographic settings which concentrate the flow of ground water, such as in draws, drainages, and stream valleys.

Selecting Well Sites

Well sites should be located so that at a depth of 100 to 150 ft the wells will penetrate whatever contact zones project updip into the nearest streambed, draw, or area of deep soil (fig. 26). The best locations are those that increase ground-water circulation along the contact zones, as where rock layers strike parallel to local drainages. In such areas deep soil normally obscures the bedrock, requiring that the dip and strike of the rock layers be determined at nearby roadcuts or similar exposures. The largest well yields generally are obtained by drilling on the downdip side of streams or other drainages where the rock layers and drainage courses are parallel (fig. 26). It is important that well sites be placed downgradient from catchment areas large enough to supply adequate recharge.

Area of Application

This method is applicable mainly to the north half of the report area where bedrock weakness and drainage patterns are closely related. In the south half of the area, the method probably will be successful mainly in headwaters areas and in draws and drainages that flow off divide ridges, especially where the strike of the rock layers and drainage courses are parallel.

Fault Zones

Fault zones become permeable mainly where they bring into contact two or more rock types that respond differently to weathering, much the same as with contact zones. Examples would be faults that displace schist (Unit C) against granite (Unit F), amphibolite (Unit E) against schist (Unit C), or a highly foliated rock against a massive rock. Several faults are visible on detailed geologic maps available for parts of the report area. (See References.)

Identifying Fault Zones

Most fault zones possess characteristic features that aid field identification. These features include: (1) angular rock fragments in fresh exposures, or preserved as relicts in saprolite, (2) zones of intense shearing, (3) terminated rock units or layers, offset beds or layers, and abrupt changes in lithology, either parallel to or across the strike, (4) abrupt offsets of drainages or valleys and abrupt changes in linear topography, (5) haphazard mixing of two or more rock types in zones less than 10 ft to more than 100 ft wide, and (6) pegmatites and vein fillings such as quartz and halloysite (clay) concentrated in bedrock or saprolite.

Recent faults may be recognized by the presence of vertical or near-vertical open fractures spaced 1 to 4 inches apart throughout a zone 10 ft to 30 ft wide. A 3- to 6-inch wide layer of fault gouge (rock flour or clay) may occur in the middle of the fault zone.

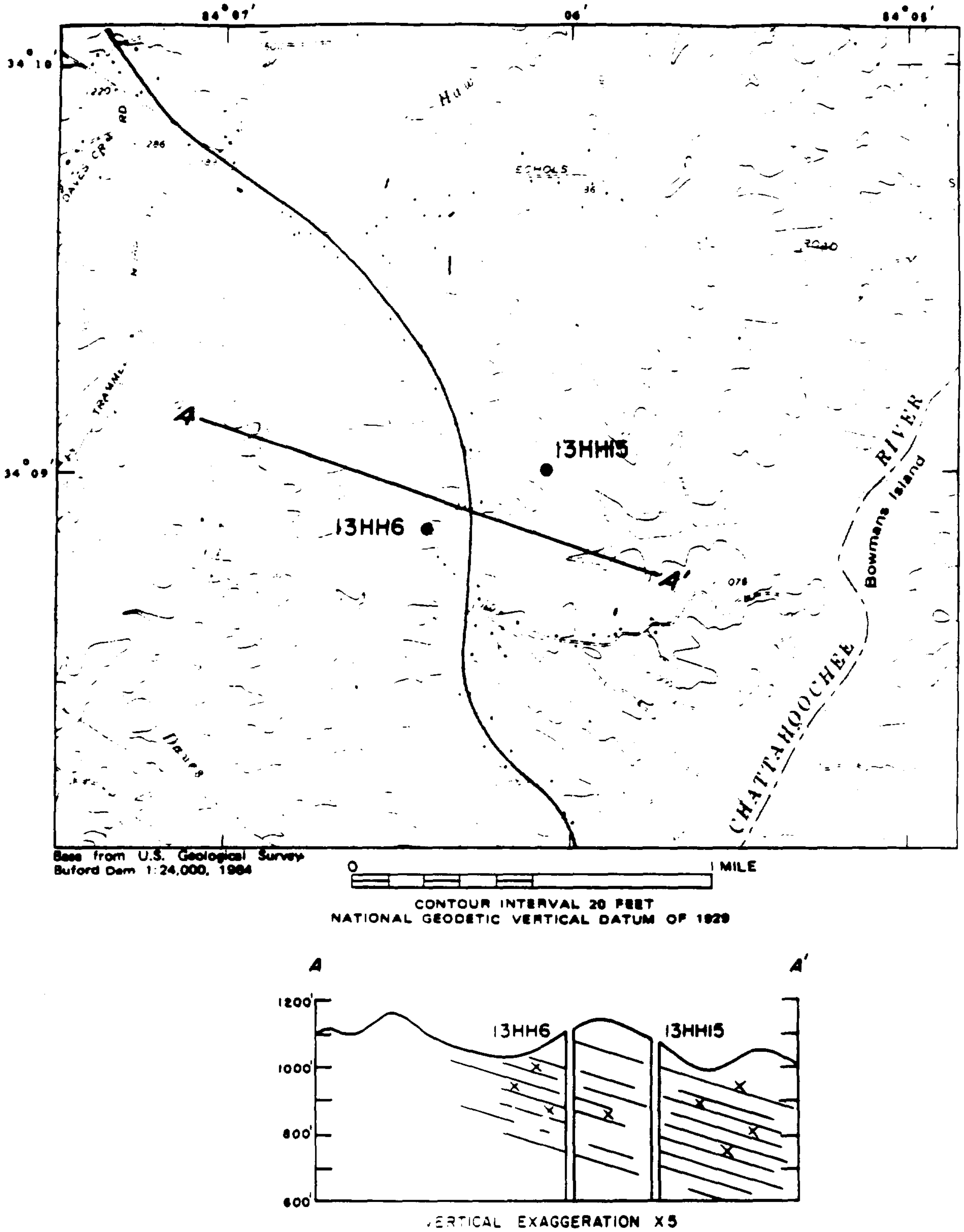


Figure 26. Wells tapping contact zones within multilayered rock unit. Well 13HH6 on downdip side of stream is 401 feet deep and yields 2- gallons per minute. Well 13HH15 is 660 feet deep and yields - gallons per minute.

Selecting Well Sites

High-yielding well sites in fault zones are selected in much the same way as they are in contact zones. The sites should be located so the wells will penetrate inclined fault zones at a depth of about 100 to 150 ft. In broad fault zones, wells can be sited in low-lying areas within the zone, preferably in draws or drainages that parallel the fault. All well sites should be downgradient from catchment areas large enough to provide adequate recharge.

Area of Application

The method is most effective in the north half of the report area where there is a strong correlation between drainage development and bedrock resistance. In the south half of the area, the method may be successful in headwaters areas, especially where faults underlie and parallel drainage courses.

Stress Relief Fractures

Stress relief fractures seem to occur mainly in large bodies of granitic and biotite gneiss (Units B and D), but they also are important in units consisting of gneiss interlayered with schist (Unit A), schist interlayered with amphibolite (Unit A) and amphibolite-hornblende gneiss (Unit E). Stress relief fractures have been observed in quartz-mica schist and they may be a common occurrence in schist units having a high quartz content. Stress relief fractures also may occur at depth in granites (Unit F), although none were identified during this study.

Identifying Stress Relief Fractures

Because of their horizontal nature and depth of occurrence, the presence of stress relief fractures is not indicated by structural and stratigraphic features normally associated with increased bedrock permeability. The only clue to their presence recognized thus far is topographic setting. Areas considered favorable for stress relief fractures include:

A. Points of land formed by (1) two streams converging at acute angles (fig. 12B, C), (2) two subparallel tributaries entering a large stream (fig. 12A, D), and (3) land protruding into the wide flood plains of large streams (fig. 12E). In 1 and 2, the points of land generally are less than 2,000 ft across.

B. Broad, relatively flat ridge areas, commonly on divide ridges, that are surrounded by stream heads (figs. 13 and 14). The wells are on the ridge crests and in the upper reaches of streams flowing off the ridges. Such areas are the sites of many towns and communities and, therefore, are centers of municipal and industrial pumpage.

C. Broad valleys formed by the removal of large volumes of material relative to the land on either side (fig. 28).

Selecting Well Sites

Topographic settings considered to be favorable areas for stress relief fractures can be identified on topographic maps. On broad, relatively flat ridge areas and in wide places on divide ridges, both of which are surrounded by stream heads, well sites may prove successful on the ridge crests and in the upper reaches of streams flowing off the ridges. On points of land, successful well sites generally are on the ridge crests or the lower ridge slopes from about midway along the ridge to near the end of the land point. Most high-yielding wells on points of land projecting into wide flood plains are near the flood plains. Statistics show that a well depth of about 620 ft is needed to test the yield potential of each site. Horizontal fractures also have been identified in the north part of the area beneath the broad valleys formed by the erosion of large volumes of material (fig. 28).

Area of Application

Stress relief fractures have been identified beneath broad ridge areas and on divide ridges surrounded by stream heads mainly in the south half of the area, but they also could occur in the north half. Relief fractures beneath points of land have been recognized only in the south part of the area. Horizontal fractures beneath broad valleys have been identified in the north part of the area, but whether they occur beneath such valleys in the south part is unknown.

Zones of Fracture Concentration

Zones of fracture concentration are likely to increase bedrock permeability in comparatively brittle rocks such as quartzite (Unit H), amphibolite and hornblende gneiss (Unit E), interlayered gneiss, schist, and amphibolite (Unit A), and possibly granite (Unit F). They are less likely to produce permeable zones in schist (Unit C), except where graywacke or quartzite forms a significant part of the unit.

Identifying Zones of Fracture Concentration

Zones of fracture concentration form linear features that appear as straight stream and valley segments; abrupt changes in valley alinement; the alinement of gulleys, small depressions, and gaps in ridges; abrupt changes in slope; and the alinement of areas having vigorous or stressed vegetation. In the south half of the area, many linear valleys are a product of dendritic drainage and are not necessarily associated with zones of fracture concentration.

Selecting Well Sites

Zones of fracture concentration may be less than 30 ft to about 200 ft wide. Thus, well sites must be on or as near as possible to the centerline of the fracture zone. The highest yielding wells generally are at the intersection of two fracture zones, which may be indicated by an abrupt change in valley trend or by the intersection of two valley segments (fig. 17). Sizable catchment areas upgradient from the well sites are needed to supply adequate recharge and sustain large well yields.

Area of Application

The method is applicable mainly to the north half of the report area where characteristic topographic expressions can be used to identify zones of fracture concentration. Zones of fracture concentration probably are present in the south, but they are difficult to identify because of the prevalent dendritic drainage in that part of the area. Their presence may be detectable in headwaters areas where topographic development is more likely to reflect zones of bedrock weakness.

Small-Scale Structures that Localize Drainage Development

Small-scale structures represent inhomogenities in rocks that enhance the rapidity and depth of weathering and increase permeability. Increases in permeability generally are much greater in directions parallel to the small-scale structures than across them. This directional permeability tends to localize drainage development parallel to the small-scale structures. Where small-scale structures underlie and trend parallel to stream valleys, drainage [illegible] draws that concentrate the flow of [illegible] they can be avenues of greatly increased permeability capable of supplying [illegible] well yields.

Identifying Small-Scale Structures

Small-scale structures associated with increased bedrock permeability include joints, bedding or compositional layering, foliation, cleavage, and the axial planes of small folds. Most small-scale structures are readily recognized on bedrock exposures and some are visible in saprolite. Structural data needed to select well sites are dip and strike of planar surfaces and the strike and plunge of fold axes. Generally, this type of data can best be obtained from field surveys of prospective sites, although detailed geologic maps provide structural data for parts of the area. (See References.) The relation of the small-scale structures to the topography can be determined by plotting the structural data on topographic maps.

Selecting Well Sites

The largest well yields can be expected from sites in stream valleys, draws, and drainages that parallel the strike of small-scale structures. Where planar structures are vertical or near vertical, as with many joint sets, the sites should be as near as practicable to the centerline of the drainage, taking into account the possibility of flooding. Where the structures are inclined, as is common with foliation and compositional layering, the most productive drilling sites may be on the downdip side of the drainages, provided the drainages are broad enough so that moving to that side does not require being on or near a steep slope or bluff, or on the nose of a ridge, no matter how small. Where possible, the sites should be downdip far enough so the well, at a depth of 100 to 150 ft, will penetrate whatever surfaces project upward into the bed of the drainage. A good combination might be a draw that parallels the strike of a well-developed set of joints, or the axial planes of minor folds, especially where the folds plunge in the downstream direction. Other good sites are in stream valleys and drainages that parallel the strike of the foliation, at points where tributary draws following cross structures such as joints enter at right angles on the downdip sides, or on both sides of the valleys. Of course, catchment areas of adequate size upgradient from the sites are needed to sustain large well yields.

Where small-scale structures and drainages are not parallel, select sites in draws or stream valleys that are as nearly parallel as possible, staying well downgradient to insure adequate recharge.

In selecting well sites, it is important to keep off any kind of crest, no matter how small or insignificant. This applies to cross ridges or ridge backs, and the noses of ridges, such as one that projects toward or into the flood plain of a stream. (This is not to be confused with much larger "points of land" described in a preceding section on Stress Relief Fractures). Where limited to a ridge top, always place the well site in a saddle or low area on the ridge top, preferably one that parallels some small-scale structure and that forms the head of a draw, no matter how slight the depression.

Also, keep in mind that in a given rock type, the more gentle the slope, the softer, more readily weathering and more permeable the rock. Beneath steeper slopes, the rock is harder, less weathered, and generally less permeable. For this reason, the more gentle the slope, the larger the well yield may be.

Area of Application

This method is applicable to all of the north half of the report area. In the south half of the area, the method probably should be limited mainly to headwaters areas and to draws and drainages that flow off divide ridges and upland areas. To be effective, there should be a clear relationship between any topographic feature and the structure of the underlying bedrock.

Folds that Produce Concentrated Jointing

Two sets of late folds in the GAR have open joints concentrated along their axes that should produce significant increases in bedrock permeability. In favorable topographic settings, these zones of concentrated jointing should supply large quantities of water to wells.

Identifying Late Folds

Late folds that produce concentrated jointing along their axes are east-west and north-south trending symmetrical anticlines about 75 to 600 ft across. The folds are most easily recognized on near-vertical bedrock exposures in road cuts and quarries, but they can be identified in natural exposures in stream valleys. They also may be recognized in cuts through saprolite.

Selecting Well Sites

Large well yields should be obtainable where zones of concentrated joints occupy topographic settings that favor increased ground-water circulation and recharge. Folds identified in road cuts and other exposures can be projected into low areas covered by deep soil, or into drainages and draws, preferably ones that parallel the fold axes. Because the greatest permeability will exist within a zone a few feet wide, wells should be centered as nearly as possible over the fold axes.

Area of Application

The method is applicable to the entire GAR.

Shear Zones

High-yielding wells are associated with major shear zones in Rockdale, Newton, Walton, and northern Spalding Counties. Smaller shear zones occur in other parts of the area and may supply large well yields.

Identifying Shear Zones

Major shear zones in Rockdale, Newton, Walton, and Spalding Counties are shown on plate 1. The shear zones, which vary from less than a mile to about 7 miles long, form prominent topographic lineaments, generally consisting of low, narrow ridges flanking long, fairly straight valleys. The lineaments can be traced in the field and are readily visible on topographic maps. The thickness of the shear zones is unknown, but the width of the associated lineaments indicates that they may be as much as several hundred feet thick. The shear zones occur in a variety of rock types, although most are in granitic gneiss (Unit B). Rocks within the shear zones consist of chert-like flinty crush rock and sheared country rock. Large permeability increases can be expected where the sheared rock has a high feldspar content.

Selecting Well Sites

The best sites for high-yielding wells should be in the linear valleys that overlie shear zones such as those shown on plate 1. Because the shear zones dip to the southeast, wells drilled near the middle or on the southeast sides of the valleys may produce the highest yields.

Area of Application

The major shear zones are in the south part of the area, but smaller shear zones occur throughout the GAR. Shearing is very common in the Brevard Fault Zone (Unit G) and may be responsible for high-yielding wells in that feature. Small shear zones were observed in the north part of the area; and, where they [illegible] favorable topographic settings, they may supply large well yields, especially where they are in feldspathic rocks.

RELATION OF WELL YIELDS TO WELL DEPTHS

It is estimated that there are more than 20,000 drilled wells in the GAR (W. A. Martin, Virginia Supply and Well Co., oral commun., 1978). Most of these wells were drilled for domestic or farm supplies, although a significant number were drilled for industrial supplies and to provide water for various commercial and public needs. These wells were located primarily for the convenience of the users, or were confined to readily available property or to areas near distribution lines and railroads. Most of the well sites were selected without regard to the suitability of geohydrologic conditions and thus, for the purposes of this study, are considered to be randomly located. The random selection of more than 20,000 drilled well sites in the GAR resulted in 1,165 wells, or approximately 5 percent, that are confirmed as being high yielding.

To conclude that only about 5 perce of the wells drilled in the GAR had t potential of supplying high yields pro ably would, however, be incorrect. Th is because most of the wells were i tended for domestic and farm use and we drilled no deeper than was required obtain the minimum acceptable yield of to 10 gal/min. Thus, most of the wel are relatively shallow and did not te the full potential of each site. Had a of the wells been drilled deeper, larger percentage likely would have be high yielding. Data obtained during th study show a strong correlation betwe well depths and yields.

The belt extending from College Pa northward through Atlanta is one ar where data are available on both hig yielding and low-yielding wells. In th belt, 40 percent of the industrial, co mercial, and public supply wells furni 50 gal/min or more; about 60 percent these wells are 400 ft to more than 6 ft deep (fig. 27). In the same are

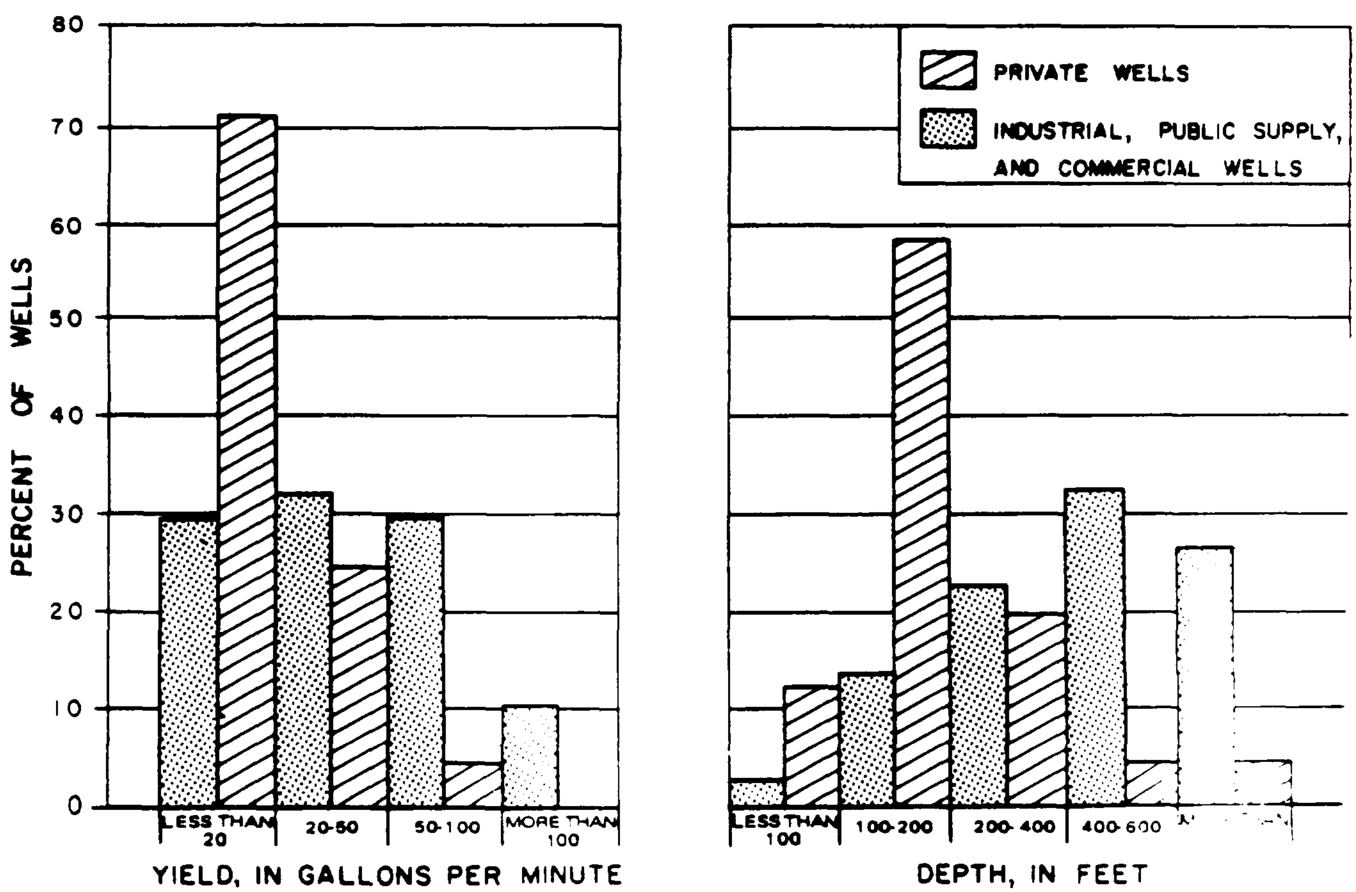


Figure 27. Relation of well yields to depths in the belt from College P... Throug

only about 6 percent of the private wells furnish 50 gal/min or more; only about 10 percent of the private wells are as deep as 400 ft. Thus, there is a strong correlation between well depths and well yields, to a depth of about 600 ft.

The data from wells in this belt indicate that the chances of obtaining a high yield from randomly located wells could be increased by consistantly drilling to depths of about 620 ft (table 9, Appendix). How this would apply to other parts of the GAR is not known, but it seems likely that deep drilling would increase the chances of obtaining large yields significantly beyond the 5-percent range. Drilling to this depth, of course, does not guarantee a high yield, as numerous wells 600 ft or more deep are reported to be dry and some wells 1,000 to 1,500 ft deep are low yielding. The well data indicate that drilling deeper than about 650 ft usually cannot be justified without supporting structural or stratigraphic evidence that indicates the presence of deeper openings.

SAFE WELL YIELDS

The safe yield of a well has been defined by Lohman (1972) as, "the amount of ground water one can withdraw without getting into trouble." In this definition, withdrawal may mean pumping a well nearly continuously, as is common with industrial and municipal supplies; seasonally, as for irrigation; or intermittently for prescribed periods each day, as to meet peak demands. Trouble may mean a number of things, including (1) running out of water, (2) declining yields, (3) muddying of the water supply during droughts, and (4) well interference.

Depending on the well, the safe yield may not remain constant, but may vary with changing conditions. For example, the safe yield may temporarily diminish during a prolonged drought. Other conditions, such as interference from nearby wells or the diversion of surface drainage and subsequent loss of available recharge, may lower the safe yield of a well. Safe yields also may vary throughout the year between wet and dry seasons. Continuous monitoring of water levels in pumping wells is a good way to determine whether safe yields are being exceeded, and it affords an opportunity to adjust pumping rates as needed to maintain optimum water levels.

Safe yield estimates on wells in the GAR generally are made from tests conducted at the time of drilling. Nearly all of the wells are drilled by the air-rotary method and the yields are estimated by blowing compressed air through the drill column and measuring the volume of water that the air expells. This method can indicate safe yields of some wells but it provides no means for measuring the drawdown and recovery during testing. Drawdown and recovery data are needed to accurately estimate safe yields, so that wells will not be equipped with pumps whose capacities are too large.

The safe yields of most wells can be estimated with reasonable accuracy from long-term pumping tests. These are tests in which the pumping rate is increased in steps or kept constant for several hours or days and the water level in the well is measured during both the pumping and the recovery phases of the tests. In general, the longer the pumping period, the more accurately safe yields can be estimated. The most accurate estimates normally are obtained from tests that run for 2 days or more, although useful estimates can be made from tests of less than 12 hours.

Long-term pumping tests have been conducted on comparatively few wells in the GAR. Most of the tests were run on industrial or privately owned wells and the results were never published. Consequently, little information is available about the drawdown and recovery characteristics of wells in different topographic and geologic settings.

Test Wells

Three test wells were drilled during this study to investigate the yield potential of different geologic settings and to learn the nature of water-bearing openings. Pumping tests were run on two of the wells to provide drawdown and recovery data needed to estimate safe yields.

The test-well sites were selected in two settings: (1) a broad valley of a perennial stream formed by the erosion of a large volume of material (fig. 28) where stress relief fractures were believed likely to occur, and (2) a narrow valley eroded by a stream flowing across the strike of resistant rocks, the stream direction probably being joint controlled (fig. 32). The second site was of particular interest because valleys of the same character are common in that area, and should they prove to be suitable sites for high-yielding wells, they could supply significant quantities of ground water.

Test Well 1

Test well 1 (8CC7) is in south Fulton County, on the flood plain of Bear Creek, a tributary of the Chattahoochee River (fig. 28). The area is underlain by moderately well-foliated biotite gneiss and minor mica schist (Unit B) that weathers very deeply. Bear Creek approximately parallels the strike of the foliation, which dips southwest at about 60°. The well site is near the Brevard Zone, but the rocks have not been sheared or mylonitized as have rocks within the zone. Well statistics are:

Depth	256 ft
Casing depth	56 ft
Diameter	6 in.
Static water level	3.85 ft below land surface
Yield (determined by compressed air test)	100 gal/min (about half of which was from the saprolite)

Casing in test well 1 was mistakenly set too shallow on a resistant rock layer in the saprolite and the well caved during development. Therefore, the well could not be tested and was used as an observation well for the pumping test done on test well 2 (8CC8).

Test Well 2

Test well 2 (8CC8), about 15 ft north of test well 1 (8CC7), is in the same geologic and topographic setting (fig. 28). Well statistics are:

Depth	243 ft
Casing depth	78 ft
Diameter	6 in.
Static water level	3.85 ft below land surface
Yield (determined by compressed air test)	45 gal/min

Most of the well water was derived from fractures at depths of 103 and 176 ft.

A step-drawdown test was conducted first to determine the approximate pumping rate that could be used in the long-term test. Pumping was done in steps of 10, 20, and 30 gal/min (fig. 29). A pumping rate of 30 gal/min for a period of 135 minutes produced a drawdown of 20 ft. Recovery of the water level after pump shutdown was rapid, being about 90 percent complete after 5 minutes and complete after 100 minutes. From these data, it was concluded that a pumping rate of 36 gal/min (the maximum capacity of the pump) would be suitable for the long-term test.

During the long-term test, a pumping rate of 36 gal/min over a period of 1,160 minutes (19.3 hours) produced a drawdown of 31 ft, to a depth of 32 ft below land surface (fig. 30). Recovery of the water level after pumping ceased was rapid; recovery was about 93 percent complete after 10 minutes and essentially complete after 300 minutes.

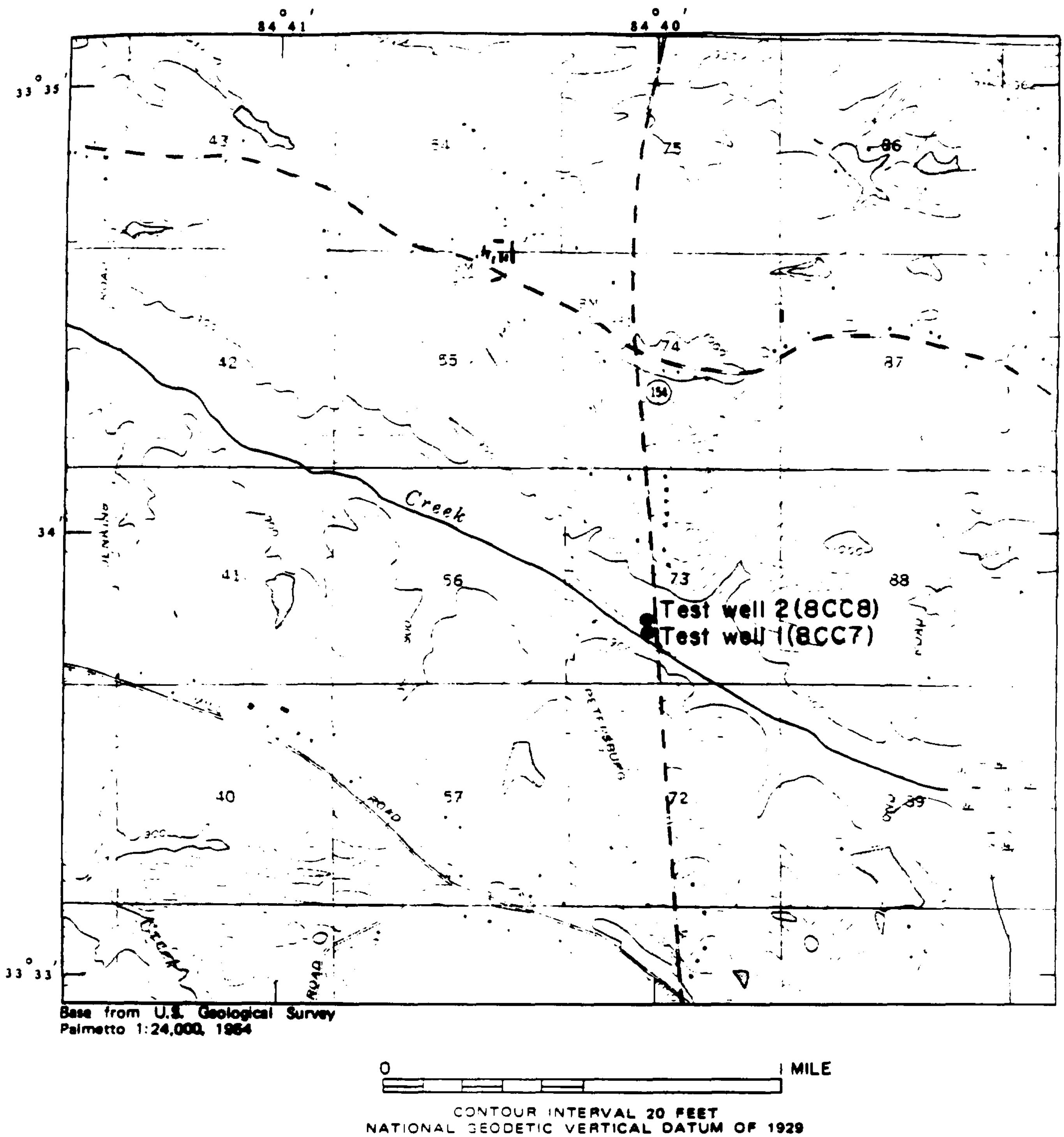


Figure 28. Topographic setting of test wells 1 (8CC7) and 2 (8CC8), Palmetto quad-rangle, Fulton County.

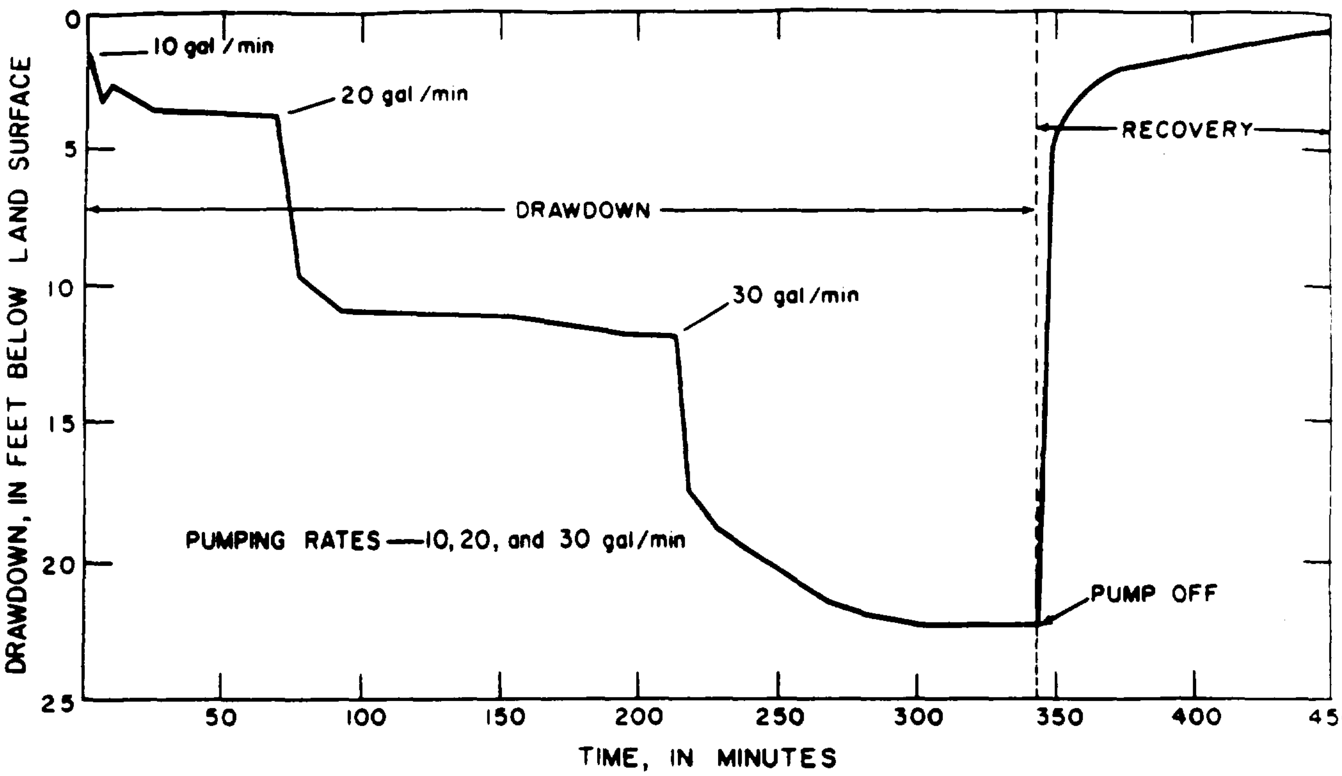


Figure 29. Drawdown and recovery curve for step drawdown test, test well 2 (8CC8).

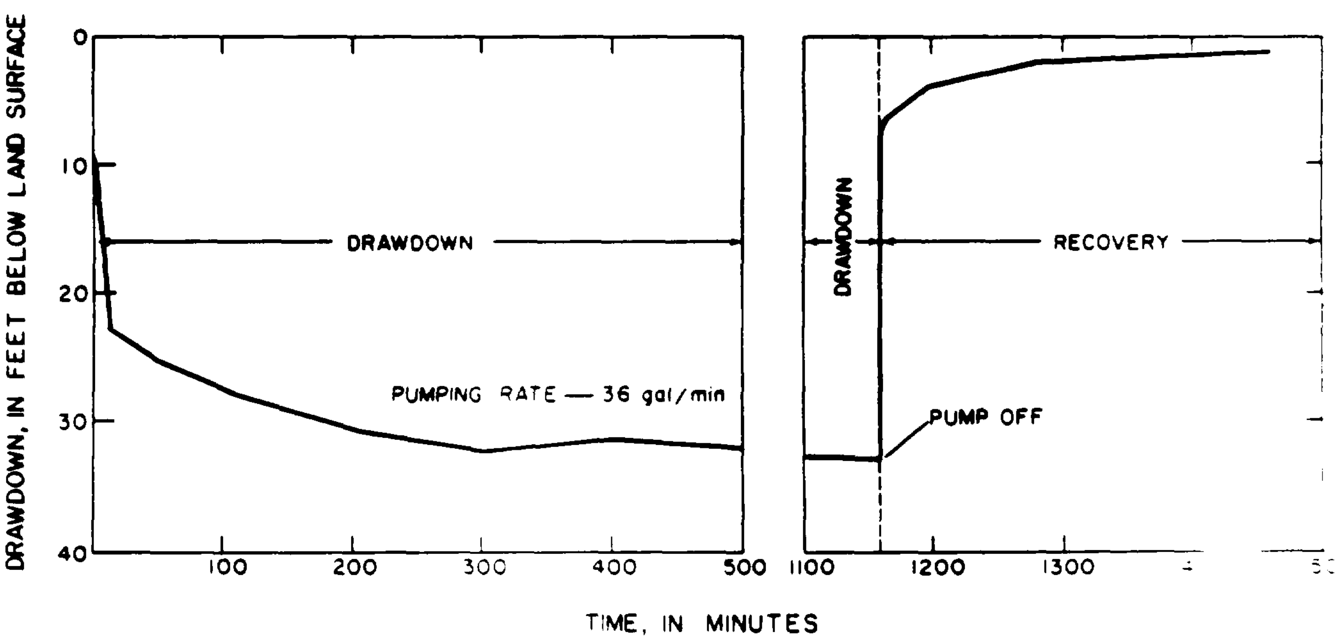


Figure 30. Drawdown and recovery curve for long-term pumping test on test well 2 (8CC8).

According to LeGrand (1967, p. 4), the increase in yield of a well in crystalline rocks is not directly proportionate to an increase in drawdown of the water level. Rather, a yield of about 80 percent of the total capacity of the well results from lowering the water level only about 40 percent of the available drawdown.[1] In test well 2 (8CC8), a pumping rate of 36 gal/min caused a decline in the water level of only about 30 percent of the available drawdown (to the top of the highest water-bearing fracture), indicating that the well was being pumped at about 60 percent of capacity (fig. 31). In light of the rapid recovery of the water level after pumping ceased, and the availability of constant recharge in the valley of a perennial stream, 36 gal/min probably is a conservative safe yield for this well. Continuous monitoring of the water level in the well during production would reveal whether that yield stresses the well and the pumping rate could be adjusted accordingly.

[1] LeGrand (1967, p. 4) referred to the available drawdown as the total depth of the well. However, in test well 2 (8CC8) the total yield is derived from only two water-bearing fractures. Thus, it would be undesirable to draw the water level down below the uppermost water-bearing fracture because doing so could lead to iron encrustation and reduced yield. In test well 3 (9DD1), discussed next, the maximum yield would be obtained by drawing the water level down to the single water-bearing fracture. Therefore, the available drawdown in these wells is considered to be the depth of the highest water-bearing fracture, thus making the percentages of relative yield somewhat conservative.

Test Well 3

Test well 3 (9DD1), in Douglas County, is on the bank of a small perennial stream that flows southeast in a narrow valley at right angles to the strike of the rocks (fig. 32). The stream is a tributary of the Chattahoochee River, which is about 0.3 mile away. The well penetrates a muscovite biotite gneiss (Unit G) containing numerous quartz veins. The well is in an area of rolling to hilly topography, which is strongly controlled by rock structure. Well statistics are:

Depth	248 ft
Casing depth	12 ft
Diameter	6 in.
Static water level	53 in. below land surface
Yield (determined by compressed air test)	40 gal/min

Nearly all of the yield was derived from a single fracture at a depth of 64 ft.

The step drawdown test conducted on this well used pumping rates of 21, 25, 30, and 40 gal/min (fig. 33). A pumping rate of 40 gal/min over a period of 340 minutes lowered the water level to a depth of 56 ft below land surface, which is about 88 percent of the distance to the water-bearing fracture that supplies the well. According to LeGrand (1967, p. 4), 40 gal/min should represent about 98 percent of the available yield of this well, indicating that it probably exceeds the safe yield. However, the rapid recovery of the water level after pumping ceased and the ready availability of recharge in the valley of a perennial stream, suggests that the well might be able to sustain this yield, at least on an intermittent schedule. Therefore a pumping rate of 40 gal/min was selected for the long-term test to see how it would affect the drawdown and to further evaluate the yield capabilities of the well.

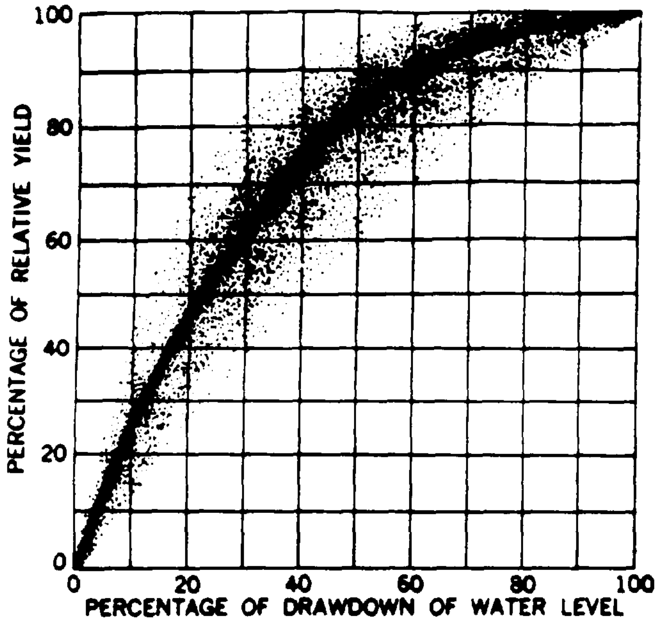


Figure 31. The curve shows that an increase in yield of a well is not directly proportionate to an increase in drawdown of the water level. A yield of nearly 80 percent of the total capacity of a well results from lowering the water level only 40 percent of the available drawdown. (LeGrand, 1967).

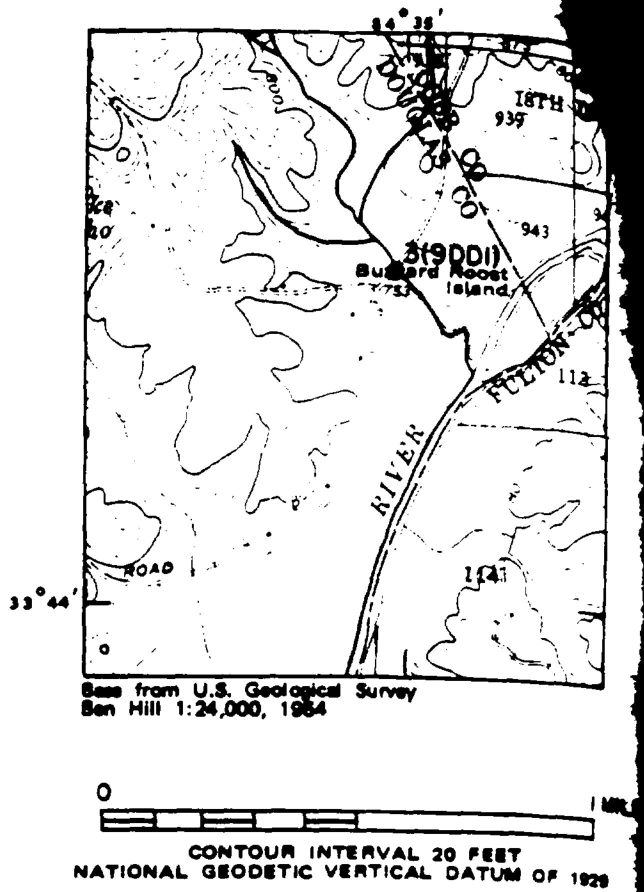


Figure 32. Topographic setting of test well 3 (9DD1), Ben Hill quadrangle, Douglas County.

Pumping at the rate of 40 gal/min for 1,140 minutes (19 hours), lowered the water level to a depth of 59.8 ft below land surface (fig. 34), which remained about 4 ft above the water-bearing fracture. After pumping stopped, recovery of the water level was fairly rapid, being 76 percent complete after 10 minutes and essentially complete after 400 minutes (6.6 hours). This means that ground water withdrawn from storage was replaced by recharge in less than 7 hours. Thus, this well may be able to sustain a pumping rate of 40 gal/min for a period of about 16 hours per day. By comparison, the safe yield for continuous pumping may be about 25 gal/min, which, during the step test, produced a drawdown of about 40 percent of the distance to the water-bearing fracture.

Because safe yields estimated in this manner are approximations and can change with time, continuous monitoring of water levels during production periods is a good way to determine whether the safe yields are being exceeded. Depending on conditions, pumping rates can be adjusted to keep water levels within safe limits.

SUSTAINED WELL YIELDS

Wells in crystalline rocks have a reputation of being unable to sustain large yields. A report by the U.S. Army Corps of Engineers (1978) on water supply possibilities for a four-county area south of Atlanta states that in the Piedmont, "ground water is scarce...and the fractured rock usually has a recharge area too small to support sustained pumping."

Data obtained during the present study show, however, that many wells in the GAR are dependable and have been pumped at high rates for many years. Table 6 (Appendix) lists 66 industrial and municipal wells currently (1980) in ... that have been pumped continuously ... 12 years or more. It is worth noting that the size of a well's yield is ... in itself indicative of the well's ability to sustain long-term pumping.

DECLINING WELL YIELDS

A number of municipal and county water systems in the GAR and adjacent areas use either (1) several widely spaced wells tied into a large distribution network, or (2) two or more wells clustered in a comparatively small area to form a well field. Distribution systems supplied by several widely spaced wells commonly are used by counties and cities that furnish water to broad areas. The wells generally occupy topographic settings favorable to recharge and, unless overpumped, are dependable even during droughts. Because they draw from a number of wells in a variety of settings, water systems of this type are comparatively trouble free.

Well Fields

Well fields consisting of 2 to 4 or more wells are used by some municipalities that distribute water to small areas. Typically, the wells are clustered within the corporate limits, which occupy the crest and slopes of broad ridges. As the demand for water increases, new wells are drilled on the same ridge or slightly downslope. Owing to the limited recharge capabilities of ridge areas, the aquifer systems beneath the towns gradually become dewatered and the wells no longer are able to satisfy the needs of the growing communities.

Most resulting well "failures" are the result of gradually declining yields that take place over periods of months or years and go unnoticed until the well "suddenly" fails. Declining well yields generally can be attributed to overpumping of the aquifer so that the rate of withdrawal exceeds the rate of recharge, or to the plugging of water-bearing openings. These problems generally can be traced to:

1. Inadequate testing in which the well was pumped at a high rate for a short time without monitoring the drawdown. The results of such testing can exaggerate the apparent yield potential of the well.

2. Testing wells by blowing with compressed air. The method provides no means of measuring drawdown and may give misleading yield projections.

3. Overly optimistic interpretation of results from a properly conducted pumping test.

4. The use of a high-capacity pump that produced excessive drawdowns and repeatedly exposed the well bore to air. Repeated exposure to air can foster the growth of iron-fixing bacteria and lead to the plugging of water-bearing openings by iron encrustations.

5. Conducting a pumping test during the winter or spring months when ground-water levels are high, rather than in late autumn when water levels are low. Although many wells are unaffected by seasonal changes in ground-water levels, some wells supply larger yields during wet periods than during dry.

Thus, improper testing of wells, seasonal changes in ground-water levels, locating wells in areas having limited recharge potential, and the use of pumps that produce excessive drawdown, all can lead to declining well yields and eventually to well failures.

Some types of well problems are temporary. Wells in which the water level draws down to the pump bowls for the first time during a period of extended drought may recover its former yield with the return of normal rainfall. In recognition of this, some towns decrease pumpage during dry periods to prevent excessive drawdown that could lead to permanent reductions in yield from iron encrustation.

Water-supply problems comm[illegible] lead city planners to consider alte[illegible]ves, such as converting to surface [illegible], but for many the lower costs favor [illegible] continued use of ground water. [illegible] such as Turin and Conyers in the GAR and Demorest, Alto, Lula, and Blairsville in areas outside the GAR, have found that additional ground-water supplies were obtainable by moving off ridges occupied by the towns into nearby stream valleys, or by drilling in more favorable sites within the town limits. Yields of 100 to 348 gal/min have been developed from wells in valley settings. Because these wells are in sites that favor recharge, the chances are good that the large yields can be sustained indefinitely.

QUALITY OF WATER

Well water in the GAR generally is of good chemical quality and is suitable for drinking and most other uses. Concentrations of dissolved constituents are fairly consistent throughout the area and, except for iron and manganese, rarely exceed drinking water standards. The few wells that contain excessively high constituent concentrations probably penetrate local mineralized zones or possibly are contaminated by surface water. Water-quality data for wells in the area are presented in table 7 (Appendix).

Large differences in constituent concentrations occur between wells deriving water from granitic (light) rocks and mafic (dark) rocks. In general, water from mafic rocks of Unit E has somewhat higher concentrations of iron, magnesium, manganese, and total dissolved solids, and a higher pH than water from granitic rocks in Units B and F. The owners of several wells in Unit E reported undesirable concentrations of iron in their water.

Anomalously high concentrations of chloride, iron, and total dissolved solids occurred in water sampled from three wells in the Austell area, Cobb County. Herrick and LeGrand (1949) suggested that these wells may penetrate mafic or ultramafic rock, but the cause of the high constituent concentrations is not known.

High concentrations of iron reported in some wells could be due to the action of iron-fixing bacteria. The presence of iron bacteria is indicated by hard iron deposits that fill pipes and coat pumps, and by slimes, scums, and filamentous bacteria that attach to well and pipe walls and fill voids in water-bearing material. The bacteria cause turbidity, discoloration, and unpleasant tastes and odors in water.

Iron bacteria may be introduced to a well bore during drilling or pump installation. For this reason, some States require sterilization of drilling tools to prevent the spreading of bacteria (Leenheer and others, 1975). Once introduced, iron bacteria are difficult to treat. A satisfactory control of the bacteria may be chlorination, though tastes and odors can persist. Also, preventing aeration of the well bore and pump by limiting drawdown of the water level can help, as iron precipitation is most active in an oxidizing environment. Continued exposure of the well bore and water-bearing openings to oxidation can result in iron encrustation and decreased well yield.

GROUND-WATER POLLUTION

Pollution of Wells

A study of the private water supplies in Bartow County (Davis, 1969, pp. 11-12) indicated that bacterial pollution of private wells is widespread. Davis found coliform bacteria in 22 percent of the 101 drilled wells sampled. Moreover, 8 percent of these drilled wells showed evidence of fecal coliform bacteria, an indicator of comparatively recent, potentially dangerous pollution.

According to Davis, improper well construction was found to be the major cause of pollution in the drilled wells. The wells surveyed by Davis ranged in depth from 47 to 328 ft. He found that 52 percent of the polluted wells had no apparent sanitary seal between the well casing and the surrounding so:.1, and 69 percent lacked a sanitary seal at the top of the casing. Thus, many poorly constructed wells are contaminated by surface water that leaks down between the casing and the surrounding soil.

The widespread pollution of wells results, in part, from the common practice of locating drilling sites for convenience rather than for protection of the water supply. Many wells are located as close as possible to the point of use without regard to potential sources of pollution such as septic tanks. Located in this manner, many poorly constructed wells are subject to pollution.

The well sites that are least likely to become polluted are those located, as far as practical, upgradient from sources of contamination. Sealing wells against the entry of surface water and fitting pump caps tightly to keep out insects, rodents, and other impurities, are also necessary safety measures to protect wells from contamination.

No detailed study has been made of well pollution in the remainder of the GAR, but wells there are subject to contamination in much the same way as those in Bartow County. Faulty well construction and improper site selection may result in polluted wells.

WATER-LEVEL FLUCTUATIONS

Seasonal changes in precipitation and evapotranspiration produce corresponding changes in ground-water levels. Rainfall in the area is heavy in winter and midsummer and relatively light in spring and autumn. Autumn is the driest season of the year. Ground-water levels rise rapidly with the onset of late winter rains and reduced evapotranspiration, and generally reach their highest levels for the year in March and April, as indicated by the hydrograph of well 10DD2 (fig. 35). Increases in evapotranspiration and decreases in rainfall during the spring and early summer cause ground-water levels to decline. Heavy precipitation in mids mer may cause small rises in ground-wa levels, but the lack of recharge f light rainfall in the autumn results water levels declining to the ann lows, generally in October or Novem (Matthews and others, 1980).

Annual water-level fluctuations in servation wells in the GAR range fro to 8 ft. During the past 10 years, av age water levels in the wells genera have varied less than 2 ft and indic no long-term trend (fig. 36).

EMERGENCY AND SUPPLEMENTAL WATER SUPPLIES

High-yielding wells in the GAR numerous enough to supply large quan ties of water for supplemental or em gency use. During this study, 1, wells were inventoried and accurate located, most of which yield 40 to m than 200 gal/min.

Because most high-yielding wells the GAR are in use and would not quic be made available for emergency supply list of wells in good condition, c rently (1980) not in use is presented table 8 (Appendix). Many of these wel probably could be made available on sh notice, although most would require stallation of a large-capacity pum More accurate location data for each w are given in the well table (table Appendix) and figure 37.

CONCLUSIONS

This study of the ground-water sources of the Greater Atlanta Reg (GAR) has produced a series of unexpec findings. Among the most significa are:

1. The area has different draina styles that profoundly affect the occ rence and availability of gr wat From the Chattahoochee River nor the area has mainly rectangul and tr lis drainage styles and streams show

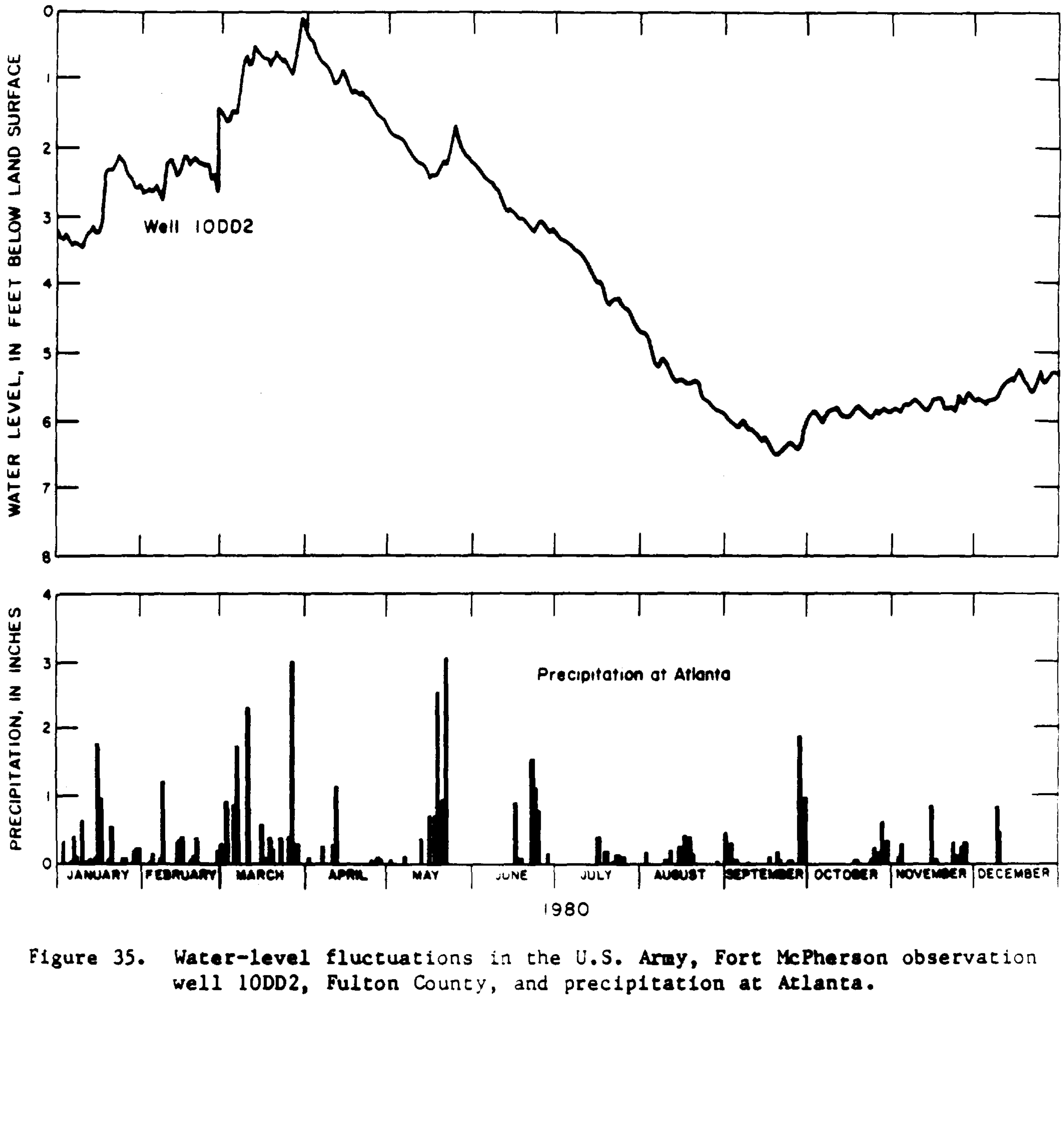


Figure 35. Water-level fluctuations in the U.S. Army, Fort McPherson observation well 10DD2, Fulton County, and precipitation at Atlanta.

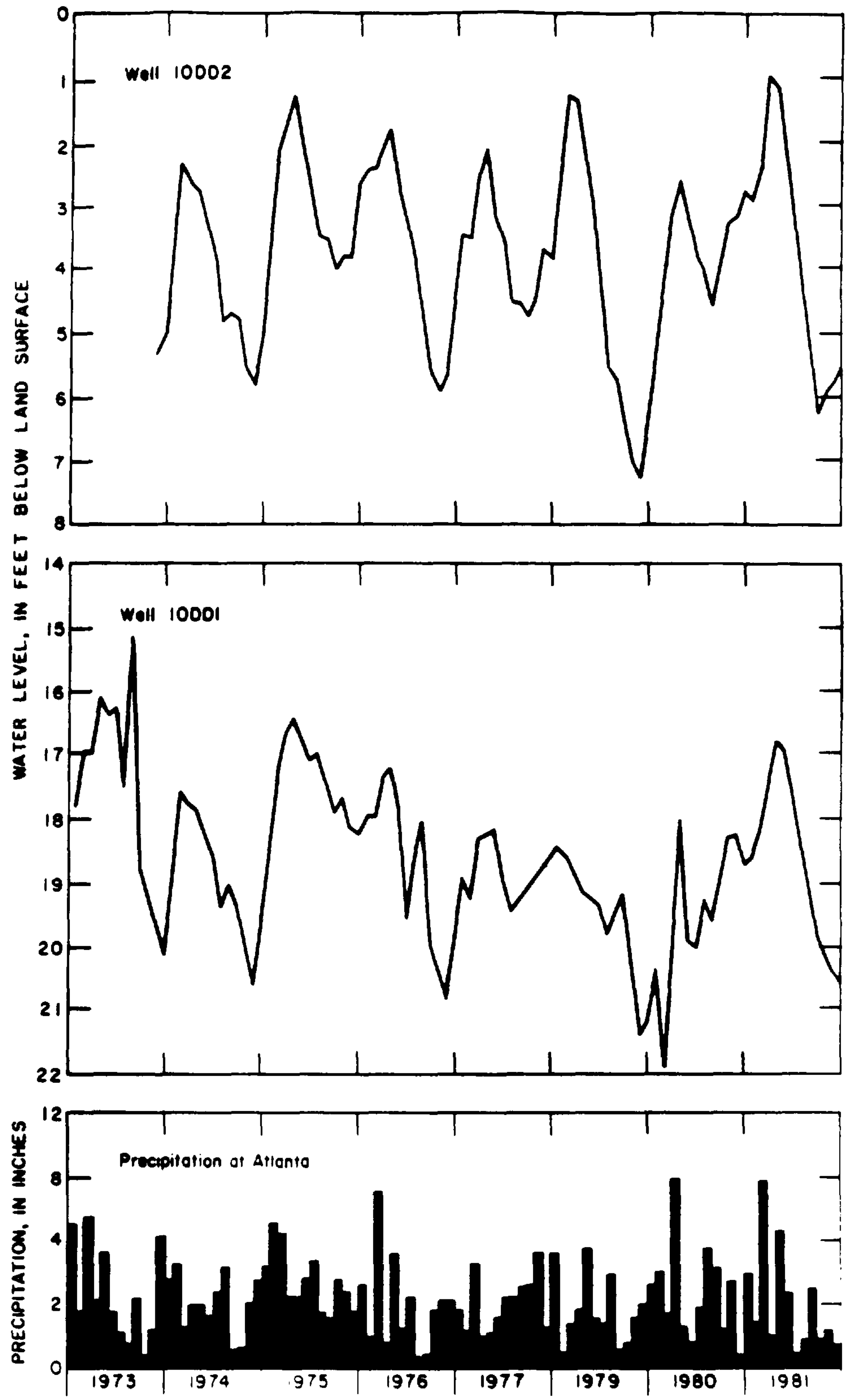


Figure 36. Water-level fluctuations in the U.S. Army, Fort McPherson observation well 10DD2 and in the O'Neil Brothers observation well 10DD1, Fulton County, and precipitation at Atlanta.

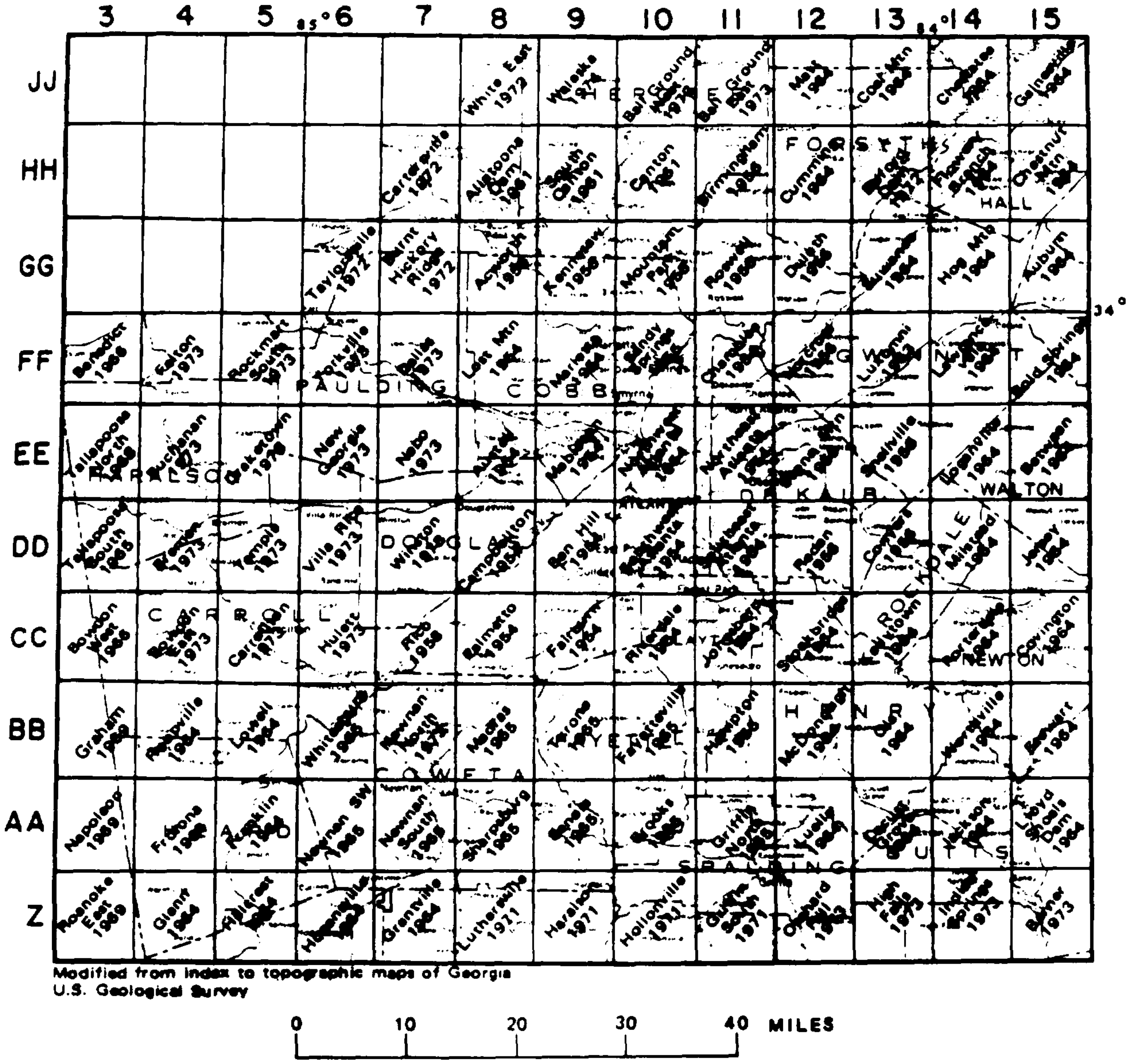


Figure 37. Number and letter designations for 7 1/2-minute quadrangles covering the Greater Atlanta Region.

influence of geologic control. The topography and drainage are closely related to bedrock permeability and therefore conventional methods for locating high-yielding well sites apply to most of the area. The south half of the area, on the other hand, has superimposed dendritic drainage style in which streams developed independently of the underlying bedrock. There, the topography and drainage are poorly related to bedrock permeability and high-yielding wells commonly occupy ridge crests, steep slopes, and bare-rock areas normally considered sites having low yield potential.

2. Geologic and topographic studies of 1,051 high-yielding well sites revealed that large well yields are available only where aquifers possess localized increases in permeability. This occurs mainly in association with specific structural and stratigraphic features: (1) contact zones between rock units of contrasting character and within multilayered rock units, (2) fault zones, (3) stress relief fractures, (4) zones of fracture concentration, (5) small-scale geologic structures that localize drainage development, (6) folds that produce concentrated jointing, and (7) shear zones. Methods were developed for selecting high-yielding well sites using these structural and stratigraph features.

3. Borehole sonic televiewer logs revealed that high-yielding water-bearing openings in granitic gneiss (Unit B), biotite gneiss (Unit D), gneiss interlayered with schist (Unit A), and quartz-mica schist (Unit C) consist mainly of horizontal or nearly horizontal fractures 1 to 8 inches in vertical dimension. The writers believe these are stress relief fractures formed by the upward expansion of the rock column in response to erosional unloading. Core drilling at two well sites confirmed the horizontal nature of the fractures and showed no indication of lateral movement that could be interpreted as faulting.

Wells that derive water from hori
tal fractures characteristically re
essentially dry during drilling ur
they penetrate the high-yielding f
ture. The high-yielding fractures ar
or near the bottom of wells because:
the large yields were in excess of
desired quantity and, therefore, dril
ceased, or (2) in deep wells yieldin
to 100 gal/min or more the large vo
of water from the fracture(s) "dro
out" the pneumatic hammers in the d
bits, effectively preventing deeper c
ling. Twenty-five wells in the re
area are known to derive water from
tom-hole fractures, all of which are
lieved to be horizontal stress re
fractures. The wells occupy a variet
topographic settings, including b
valleys, ridge crests, steep slopes,
bare-rock areas, because horizontal f
tures are present beneath uplands
lowlands alike.

Wells deriving water from stress
lief fractures have much greater ave
depth than wells reported from o
crystalline rock areas. Many of
wells are 400 to 600 feet deep and de
water from a single fracture at the
tom of the hole.

4. Contrary to popular belief, c
wells in the GAR are highly depends
and have records of sustaining la
yields for many years. Sixty-six ma
industrial and municipal wells have
pumped continuously for periods of l
more than 30 years without experien
declining yields.

5. Large supplies of ground w
presently are available in the a
Most of the 1,165 high-yielding well
ventoried during the study supply fr
to more than 200 gal/min. The distr
tion of these wells with respec
topography and geology indicates
most were located for the convenienc
the users and that the large yields
sulted mainly from chance, rather
from thoughtful site select

ploying the site selection methods outlined in this report, it should be possible to develop large supplemental ground-water supplies in most of the area from comparatively few wells.

6. Well water in the area generally is of good chemical quality and is suitable for drinking and most other uses. Concentrations of dissolved constituents are fairly consistent throughout the area, and except for iron and manganese, rarely exceed drinking water standards. However, in some more densely populated areas, aquifer contamination from septic tank effluent is a significant problem.

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Table 9.—Record of wells in the Greater Atlanta Region—Continued

Well No.	Owner	Water-bearing unit	Latitude and longitude	Yield (gal/min)	Depth (ft)	Casing depth (ft)	Casing diam. (in.)	Date drilled	Driller	Elevation (ft)	Water level below land surface: Static head (ft)	Water level below land surface: Pumping head (ft)
Fulton County												
11EE10	T. Wayne Blanchard 564 Wimbledon Rd. Atlanta	D	33°48'26" 84°22'07"	38	350	20	6	—	Virginia	900	40	200
11FF4	Landmark Apartments I-285 at 5775 Glenridge Rd. Atlanta	G	33°54'45" 84°21'35"	30	173	63	6	11/72	do.	950	10	173
11FF5	W. A. Williams 24 Laurel Dr., NE Atlanta	H,C	33°55'46" 84°21'28"	25	318	79	6	7/60	do.	1,110	62	160
11FF6	Femcroft Apartments 6851 Roswell Rd. Atlanta	A	33°56'31" 84°22'19"	60	106	45	6	1973	Ward	940	—	—
11FF7	Atlanta Assoc. of Baptist Churches 1900 Northridge Dunwoody	C	33°59'14" 84°19'32"	23	450	39	6	6/56	Virginia	920	60	180
11FF8	E. A. Isakson 1275 Riverside Rd. Roswell	C	33°59'25" 84°19'21"	50	201	19	6	5/66	do.	870	—	—
11FF9	Dr. Robert Smith, III 1750 Brandon Hall Dunwoody	A	33°59'04" 84°18'09"	40	205	70	6	12/76	do.	880	—	—
11FF10	Bill Weaver 3450 Spalding Dr. Atlanta	H	33°57'57" 84°17'36"	30	185	—	6	8/67	do.	990	30	100
11FF11	V. A. Pinnell 3400 Spalding Dr. Atlanta	C,H	33°57'55" 84°17'38"	75	—	—	—	1962	J.A. Wood	990	—	—
11FF12	Joe A. Seibold 8099 Jett Ferry Dunwoody	A	33°58'13" 84°17'15"	30	150	27	6	5/55	Virginia	900	0	100
11FF14	Sidney Wooten 7700 Jett Ferry Dunwoody	H,A	33°57'53" 84°18'09"	100	153	51	6	8/79	—	1,100	—	—
11GG1	J. S. Robinson 400 Grimes Bridge Roswell	C,A	34°00'55" 84°20'15"	24	323	38	6	11/68	Virginia	1,080	—	—
11GG2	A. C. Morris, Jr. 350 Hollyberry Dr. Roswell	C	34°03'25" 84°21'00"	25	306	28	6	4/71	do.	1,100	—	—
11GG3	Jerry Bowden Tota Water Farms 12405 Etris Rd. Roswell	C	34°05'05" 84°22'06"	23	173	61	6	1/71	do.	1,060	--	[illegible]
11GG4	Thomas Archer 335 Ranchette Rd. Alpharetta	C,A	34°06'04" 84°22'17"	50	126	46	6	9/71	Ward	1,080	--	
11GG5	Roger Hopper 185 Dorris Rd. Alpharetta	C	34°06'26" 84°21'24"	30	240	35	6	4/78	Virginia	1,020	--	

Table 9.—Record of wells in the Greater Atlanta Region—Continued

Well No.	Owner	Water-bearing unit	Latitude and longitude	Yield (gal/min)	Depth (ft)	Casing depth (ft)	Casing diam. (in.)	Date drilled	Driller	Elevation (ft)	Water level below land surface: Static head (ft)	Water level below land surface: Pumping head (ft)
Fulton County												
11GG6	Fulton Co. Board of Education Northwestern School Crabapple	A	34°05'36 84°20'30"	60	200	22	6	1/55	Virginia	1,100	10	136
11GG7	F. J. Russell, Jr. Haygood Rd. Alpharetta	A	34°07'11" 84°18'18"	24	234	26	6	12/65	do.	1,020	—	—
11GG8	City of Alpharetta Alpharetta	A	34°04'33" 84°17'38"	60	250	66	8	8/51	do.	1,130	—	120
11GG9	do.	E,A	34°04'12" 84°17'36"	75	300	—	10	—	—	1,090	—	—
11HH6	Robert E. Wildman Rte. 3, Red Rd. Alpharetta	E	34°07'46" 84°18'58"	30	—	—	—	—	Virginia	1,070	—	—
12FF1	Riverbend Gun Club Highway 141 Norcross	G	3°59'24" 84°10'12"	55	160	71	6	9/66	do.	880	—	—
12GG5	Neal Embry 10505 Embry Farms Duluth	G	34°02'17" 84°07'35"	37	245	67	6	19/74	do.	930	20	245

Reference 16

RCE • Environmental Science Services Administration • Environmental Data Service

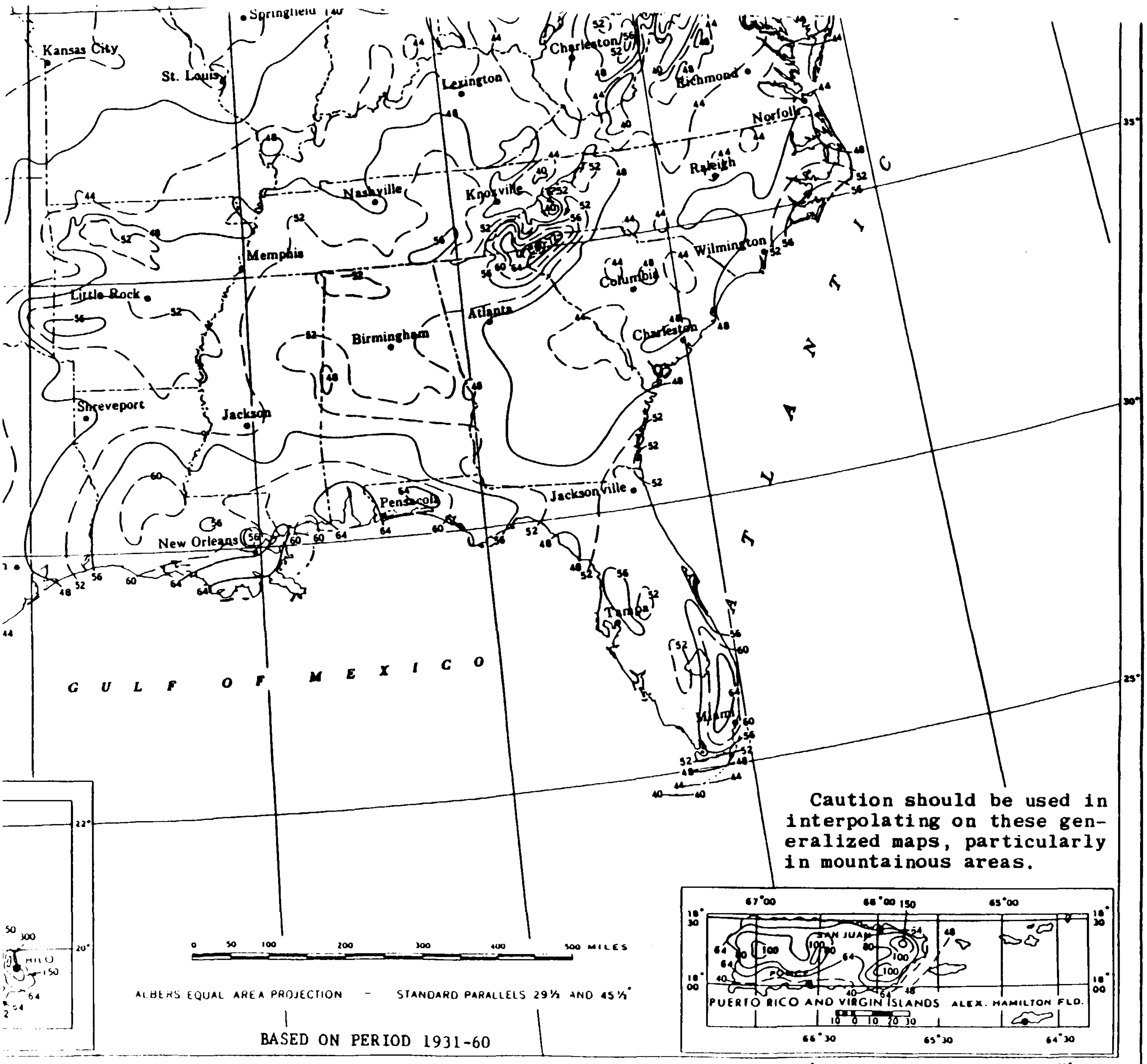
U.S. DEPARTMENT OF COMMERCE
C. R. Smith, Secretary

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
Robert M. White, Administrator

ENVIRONMENTAL DATA SERVICE
Woodrow C. Jacobs, Director

JUNE 1968

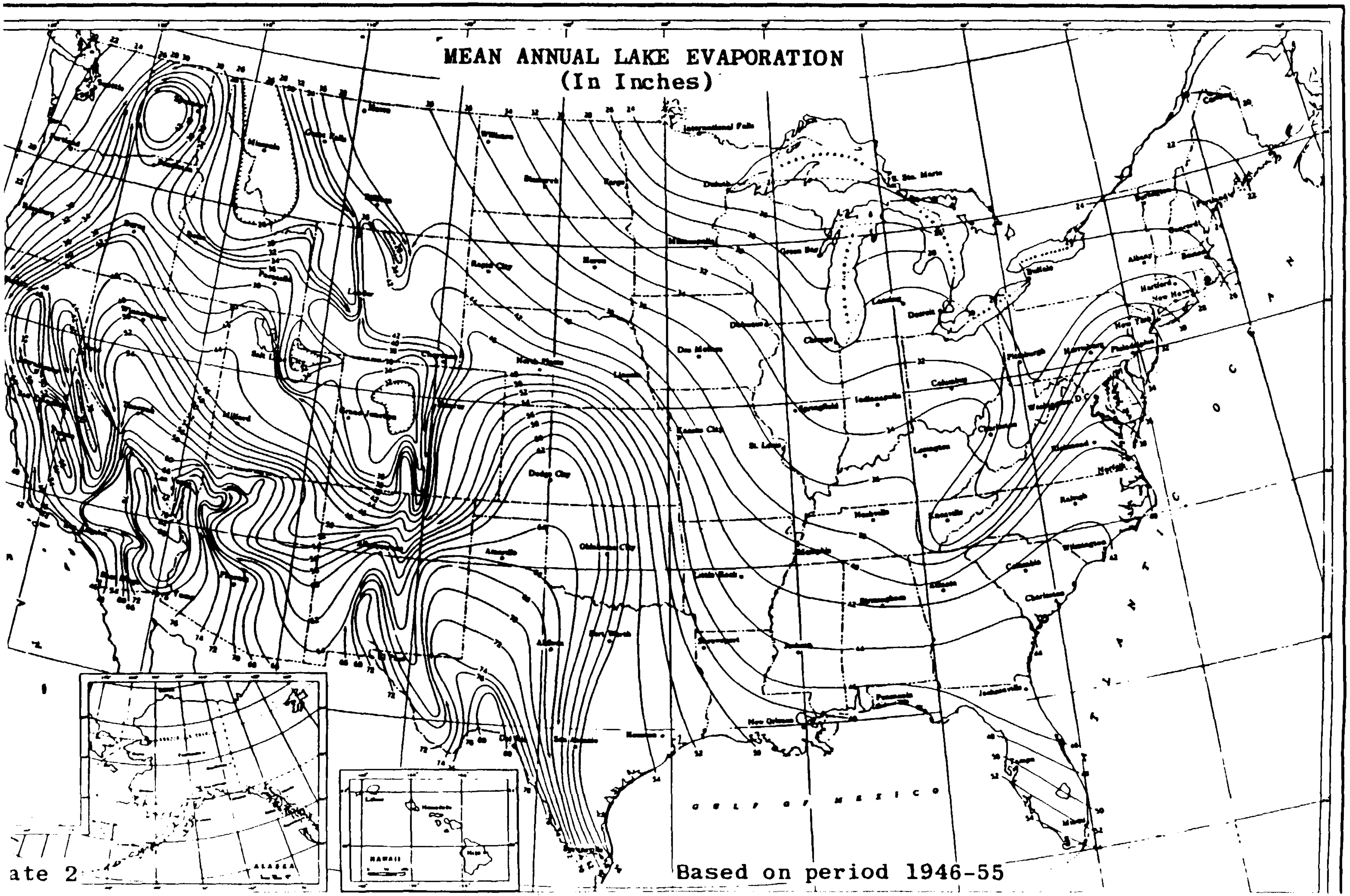
REPRINTED BY THE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
1983



Caution should be used in interpolating on these generalized maps, particularly in mountainous areas.

BASED ON PERIOD 1931-60

E EVAPORATION



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TECHNICAL PAPER NO. 40

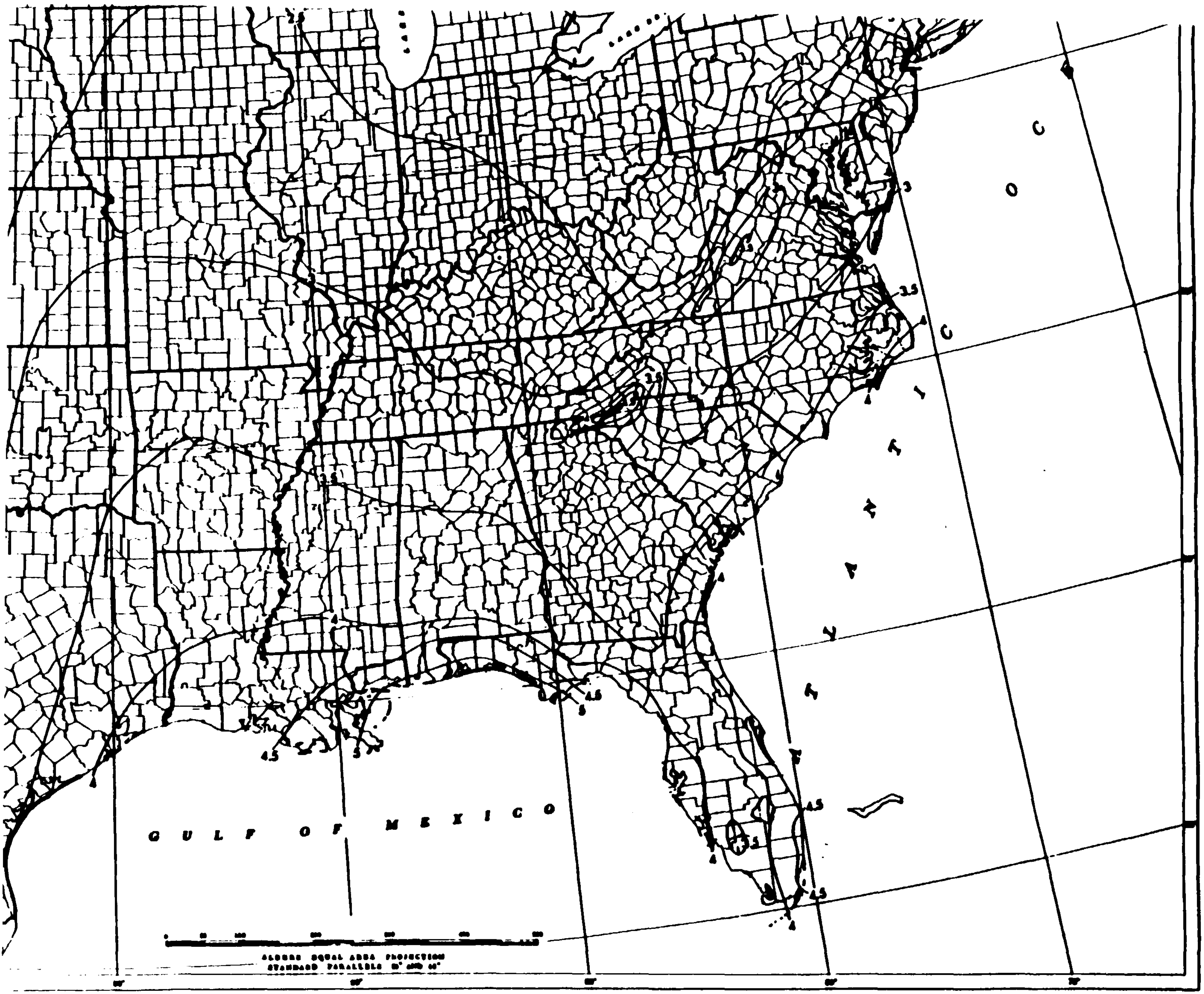
RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division

for

Engineering Division, Soil Conservation Service
U.S. Department of Agriculture


GULF OF MEXICO

NUS CORPORATION AND SUBSIDIARIES Reference 18 **TELECON NOTE**

CONTROL NO: F4-8909-03	**DATE:** 9-14-89	**TIME:** 4:15

DISTRIBUTION: Crosby Stevens Co.

BETWEEN: Phil Bingham	**OF:** East Point Public Works Dept.	**PHONE:** (404) 765-1039

AND: Mary McDonald

DISCUSSION: Street sewars on Central Avenue in East Point are connected to South River Treatment Plant on the South River.

ACTION ITEMS:

REFERENCE 19

NUS CORPORATION AND SUBSIDIARIES

CONTROL NO.	DATE: August 30, 1989	TIME: 1:50 p.m.

DISTRIBUTION:

ESB, Inc.

BETWEEN: Alfred Mauldin	OF: Ga Dept. of Natural Resources	PHONE: (404) 656-4817

AND: Cindy Gurley, NUS Corporation

DISCUSSION:

There is no commercial fishing in the South River until the river runs into Lake Jackson (Butts County).

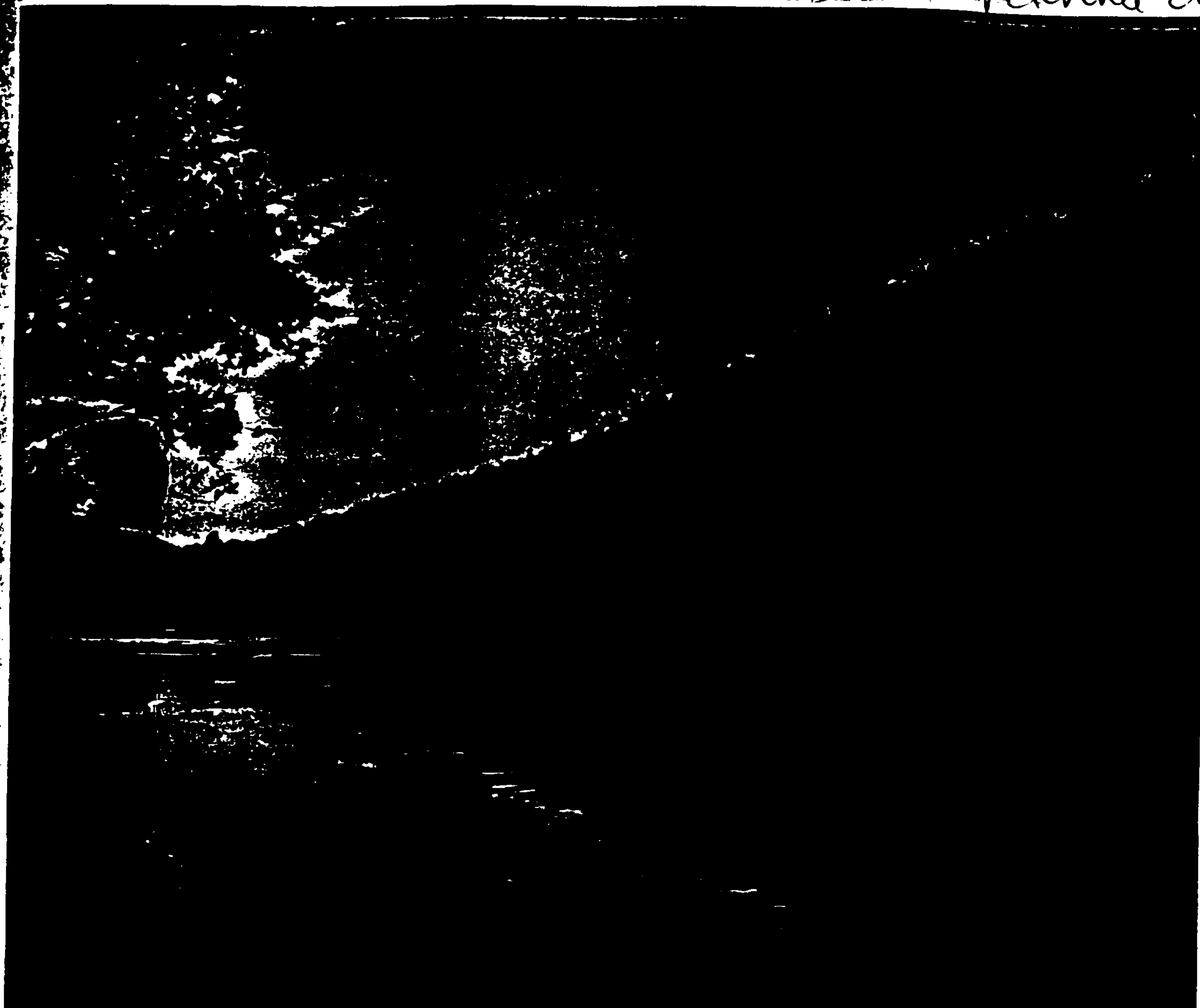
The South River is not easily accessible, only at bridges. Mr. Mauldin could not recall any boat ramps.

The commercial fishing at reservoirs are minimal.

There is recreational fishing on the South River.

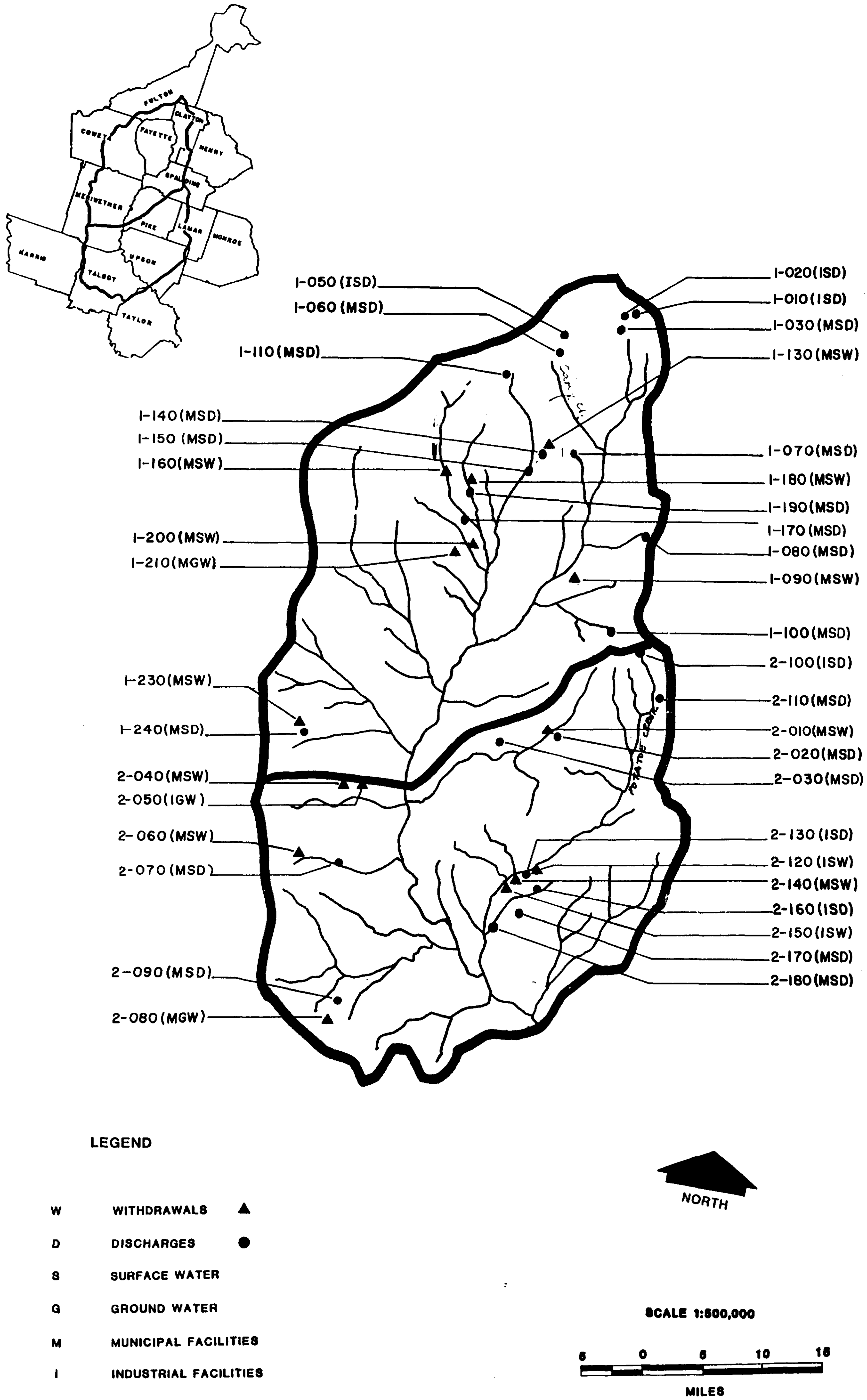
ACTION ITEMS:

Reference 20



Water Availability & Use Flint River Basin

Georgia Department of Natural Resources
Environmental Protection Division



FLINT RIVER WATER AVAILABILITY AND USE REPORT	GEORGIA ENVIRONMENTAL PROTECTION DIVISION	MAJOR WATER USERS HYDROLOGIC UNITS 1 & 2 FIGURE 10

NUS CORPORATION AND SUBSIDIARIES **REFERENCE** 21 *TELECON NOTE*

CONTROL NO.	DATE: 4-14-89	TIME: 1100

DISTRIBUTION: To File

BETWEEN: Superintendant	OF: East Point Water Dept.	PHONE: (404) 765-1070

AND: Jeff Myers, NUS Corporation

DISCUSSION:

The superintendant of East Point Water Department said they obtain their water from an intake in Sweetwater Creek, just north of Lower River Road The water is pumped from there to a 300 million gallon tank in the city of Ben Hill. Water lines cover the entire 4-mile radius. The water intake serves both East Point and College Park.

NUS 067 REVISED 0685

Reference 22

ENDANGERED AND THREATENED SPECIES

U.S. FISH AND WILDLIFE SERVICE

REGION 4 - ATLANTA

Federally Listed Species by State

GEORGIA

(E=Endangered; T=Threatened; CH=Critical Habitat determined)

Mammals	General Distribution
Bat, gray (*Myotis grisescens*) - E	Northwest, West
Bat, Indiana (*Myotis sodalis*) - E	Extreme Northwest
Manatee, West Indian (*Trichechus manatus*) - E	Coastal waters
Panther, Florida (*Felis concolor coryi*) - E	Entire state
Whale, finback (*Balaenoptera physalus*) - E	Coastal waters
Whale, humpback (*Megaptera novaeangliae*) - E	Coastal waters
Whale, right (*Eubalaena glacialis*) - E	Coastal waters
Whale, sei (*Balaenoptera borealis*) - E	Coastal waters
Whale, sperm (*Physeter catodon*) - E	Coastal waters

Birds	
Eagle, bald (*Haliaeetus leucocephalus*) - E	Entire state
Falcon, American peregrine (*Falco peregrinus anatum*) - E	North
Falcon, Arctic peregrine (*Falco peregrinus tundrius*) - T	Coast, Northwest
Stork, wood (*Mycteria americana*) - E	Southeastern swamps
Warbler, Bachman's (*Vermivora bachmanii*) - E	Entire state
Warbler, Kirtland's (*Dendroica kirtlandii*) - E	Coast
Woodpecker, ivory-billed (*Campephilus principalis*) - E	South, Southwest
Woodpecker, red-cockaded (*Picoides* (=*Dendrocopos*) *borealis*) - E	Entire state

Reptiles	
Alligator, American (*Alligator mississippiensis*) - E	Inland coastal plain
Alligator, American (*Alligator mississippiensis*) - T	Coastal areas
Snake, eastern indigo (*Drymarchon corais couperi*) - T	Southeast
Turtle, Kemp's (Atlantic) ridley (*Lepidochelys kempii*) - E	Coastal waters
Turtle, green (*Chelonia mydas*) - T	Coastal waters

GEORGIA (cont'd)

	General Distribution
Turtle, hawksbill (*Eretmochelys imbricata*) - E	Coastal waters
Turtle, leatherback (*Dermochelys coriacea*) - E	Coastal waters
Turtle, loggerhead (*Caretta caretta*) - T	Coastal waters

Fishes

Darter, amber (*Percina antesella*) - E,CH	Conasauga R., Murray County
Darter, snail (*Percina tanasi*) - T	S. Chickamauga Cr., Catoosa County
Logperch, Conasauga (*Percina jenkinsi*) - E,CH	Conasauga R., Murray County
Sturgeon, shortnose (*Acipenser brevirostrum*) - E	Coastal rivers

Plants

Florida torreya (*Torreya taxifolia*) - E	Decatur County
Green pitcher plant (*Sarracenia oreophila*) - E	Towns County
Hairy rattleweed (*Baptisia arachnifera*) - E	Wayne, Brantley Counties
Persistent trillium (*Trillium* (*persistens*) - E	Tallulah-Tugaloo River system, Rabun and Habersham Counties
Small whorled pogonia (*Isotria medeoloides*) - E	Rabun County

RECONNAISSANCE CHECKLIST FOR HRS2 CONCERNS

Instructions: **Obtain as much "up front" information as possible prior to conducting fieldwork. Complete the form in as much detail as you can, providing attachments as necessary. Cite the source for all information obtained.**

Site Name: Prisma Universal Corp.
City, County, State: East Point, Fulton, GA
EPA ID No.: GAD 088 935 960
Person responsible for form: Solomon Pollard
Date: 11 - 27 - 89

Air Pathway

Describe any potential air emission sources onsite: None

Identify any sensitive environments within 4 miles: none

Identify the maximally exposed individual (nearest residence or regularly occupied building - workers do count): Facility in in a zoned commercial district / adjacent to a community. All within a large metropolitan city.

Groundwater Pathway

Identify any areas of karst terrain: none

Identify additional population due to consideration of wells completed in overlying aquifers to the AOC: none

Do significant targets exist between 3 and 4 miles from the site? no

Is the AOC a sole source aquifer according to Safe Drinking Water Act? (i.e. is the site located in Dade, Broward, Volusia, Putnam, or Flagler County, Florida): ~~NA~~ no

Surface Water Pathway

Are there intakes located on the extended 15-mile migration pathway? no

Are there recreational areas, sensitive environments, or human food chain targets (fisheries) along the extended pathway? yes

Onsite Exposure Pathway

Is there waste or contaminated soil onsite at 2 feet below land surface or higher? unknown

Is the site accessible to non-employees (workers do not count)? no

Are there residences, schools, or day care centers onsite or in close proximity? yes: numerous schools in water path

Are there barriers to travel (e.g., a river) within one mile? no.

CERCLA ELIGIBILITY QUESTIONNAIRE

Site Name: Prismo Universal Corporation

City: East Point State: GA

EPA I.D. Number: GAD 088935960

I. CERCLA ELIGIBILITY

	YES	NO
Did the facility cease operations prior to November 19, 1980?		X

If answer YES, STOP, facility is probably a CERCLA site
If answer NO, Continue to Part II

II. RCRA ELIGIBILITY

	YES	NO
Did the facility file a RCRA Part A application?	X	
If YES:		
1) Does the facility currently have interim status?		X
2) Did the facility withdraw its Part A application?	X	
3) Is the facility a known or possible protective filer? (facility filed in error)		X

4) Type of facility:
Generator X Transporter___ Recycler___
TSD (Treatment/Storage/Disposal)___

	YES	NO
Does the facility have a RCRA operating or post closure permit?		X
Is the facility a late (after 11/19/80) or non-filer that has been identified by the EPA or the State? (facility did not know it needed to file under RCRA)		X

If all answers to questions in Part II are NO, STOP, the facility is a CERCLA eligible site.

If answer to #2 or #3 is YES, STOP, the facility is a CERCLA eligible site.

If #2 and #3 are NO and any OTHER answer is YES, site is RCRA, continue to Part III.

III: RCRA SITES ELIGIBLE FOR NPL

	YES	NO
Has the facility owner filed for bankruptcy under federal or state laws?		X
Has the facility lost RCRA authorization to operate or shown probable unwillingness to carry out corrective action?		X
Is the facility a TSD that converted to a generator, transporter or recycler facility after November 19, 1980?	X	

Site Inspection Report

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D088935960

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Prismo Universal Corp	2675 Martin Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
East Point,	GA	30344	Fulton	121	06

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
33 39 30	82 26 37.0	☒ A. PRIVATE ☐ B. FEDERAL ____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
10 , 1989 (MONTH DAY YEAR)	■ ACTIVE ☒ INACTIVE	1957 , 1984 (BEGINNING YEAR, ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☒ B. EPA CONTRACTOR NUS Corp (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ____ (Name of firm)

☐ E. STATE ☐ F. STATE CONTRACTOR ____ (Name of firm) ☐ G. OTHER ____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO
Solomon Pollard	Toxicologist	NUS FIT	(404) 938 7710

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO
Prince L Goins	Chemist	FIT	(404) 938 7710
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☐ PERMISSION ☐ WARRANT	1040	Cloudy 42°

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Mario Villamarzo	EPA Region 4	(404) 347-5065

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Solomon Pollard	NUS Corp	FIT	(404) 938 7710	11 27 89 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	DOY9935960

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER FINES
- [x] C SLUDGE
- D OTHER ________ (Specify)
- E SLURRY
- [x] F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS ________
- CUBIC YARDS ________
- NO OF DRUMS ________

03 WASTE CHARACTERISTICS (Check all that apply)

- [x] A TOXIC
- [x] B CORROSIVE
- C RADIOACTIVE
- D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- [x] G FLAMMABLE
- H IGNITABLE
- [x] I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	unknown		paint waste
OLW	OILY WASTE			
SOL	SOLVENTS	unknown		benzene + toluene
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SOL	toluene	108-883	M&M Chemical Co.		
~~[illegible]~~	benzene	7143-2	M&M Chemical Co		
			SCA Services Inc		
SLU	unknown (residue from tanks) paint				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State + EPA file,

EPA	POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS	I. IDENTIFICATION 01 STATE: GA 02 SITE NUMBER: D088935960

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

NA

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 6-15-83) ☐ POTENTIAL ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Overflowing tanks of caustic waste, possibly entering small creek in surface path.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

NA

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

NA

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

NA

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ______ (Acres) 04 NARRATIVE DESCRIPTION

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 6-15-83) ☐ POTENTIAL ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Deliberate dumping of drum contents in drum storage area, spillage of alkyd resins (off-loading ramp)

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

NA

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

NA

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	DO 8993 5960

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

NA

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

NA

01 ☐ L CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

AA

01 ☐ M UNSTABLE CONTAINMENT OF WASTES (Spills Runoff Standing liquids Leaking drums) — 02 ☐ OBSERVED (DATE ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

NA

01 ☐ N DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

NA

01 ☒ O CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE 6-15-83) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION

Deliberate dumping of drums (contents) in drum storage area, fluids running into sewer

01 ☐ P ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

NA

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: 1 mile - greater than 250 000 site located in metro. area of city (heavily populated).

IV. COMMENTS

On June 24, 1983 - contaminated soil adjacent to drum storage area was removed + disposed of in a permitted haz waste disposal site.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State + EPA File Materials

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D058935960

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☒ C. DRUMS, ABOVE GROUND	678.38	gals
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

☐ A. INCENERATION
☐ B. UNDERGROUND INJECTION
☐ C. CHEMICAL/PHYSICAL
☐ D. BIOLOGICAL
☐ E. WASTE OIL PROCESSING
☐ F. SOLVENT RECOVERY
☐ G. OTHER RECYCLING/RECOVERY
☐ H. OTHER (Specify)

05 OTHER

☒ A. BUILDINGS ON SITE

06 AREA OF SITE

less than 1acre (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Small quantity generator from 80-84. Drums Kept on loading dock.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE ☐ YES ☒ NO

02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

State + EPA file materials

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE: GA | 02 SITE NUMBER: D08893596

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

	ENDANGERED	AFFECTED	MONITORED
COMMUNITY	A. ☐	B. ☐	C. ☐
NON-COMMUNITY	D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 7.15 mi (mi)

B. ______ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING

☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available)

☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available)

☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER: ~~[illegible]~~ unknown

03 DISTANCE TO NEAREST DRINKING WATER WELL: none (mi)

04 DEPTH TO GROUNDWATER: 150 (ft)

05 DIRECTION OF GROUNDWATER FLOW: South east

06 DEPTH TO AQUIFER OF CONCERN: 150 (ft)

07 POTENTIAL YIELD OF AQUIFER: ______ (gpd)

08 SOLE SOURCE AQUIFER: ☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

10 RECHARGE AREA

☐ YES ☐ NO COMMENTS

11 DISCHARGE AREA

☐ YES ☐ NO COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION DRINKING WATER SOURCE

☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES Fishing

☐ C. COMMERCIAL, INDUSTRIAL

☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME	AFFECTED	DISTANCE TO SITE
South River	☐	<2 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE A. ______ NO. OF PERSONS

TWO (2) MILES OF SITE B. ______ NO. OF PERSONS

THREE (3) MILES OF SITE C. ______ NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: <100 ft (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: 750

04 DISTANCE TO NEAREST OFF-SITE BUILDING: 100 ft (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

State + EPA file material

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D 088935960

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-?} - 10^{-?}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-5}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
____ (ft)	____ (ft)	____

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
7 (in)	3.25 (in)	5.1 %	South east	1 %

09 FLOOD POTENTIAL

SITE IS IN ____ YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE A. ____ (mi) OTHER B. ____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species) ____ (mi)

ENDANGERED SPECIES: ____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. 2 (mi)	B. 2 (mi)	C. ____ (mi)	D. ____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

East of Property is residential district.
All other directions have commercial land

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State + EPA file materials

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D089135960

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☑ GROUND ☐ AERIAL

02 IN CUSTODY OF NWS Corp
(Name of organization or individual)

03 MAPS ☑ YES ☐ NO

04 LOCATION OF MAPS NWS Corporation

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

State + EPA file Material

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D088935960

II. CURRENT OWNER(S) / PARENT COMPANY (If applicable)

CURRENT OWNER(S)			PARENT COMPANY		
01 NAME: Redland Prismo Co.		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): 1204 Airport Rd		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY: Ball Ground	06 STATE: GA	07 ZIP CODE: 30344	12 CITY:	13 STATE:	14 ZIP CODE:
01 NAME:		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	12 CITY:	13 STATE:	14 ZIP CODE:
01 NAME:		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	12 CITY:	13 STATE:	14 ZIP CODE:
01 NAME:		02 D+B NUMBER:	08 NAME:		09 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	10 STREET ADDRESS (P.O. Box, RFD #, etc.):		11 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	12 CITY:	13 STATE:	14 ZIP CODE:

III. PREVIOUS OWNER(S) (List most recent first) / IV. REALTY OWNER(S) (If applicable; list most recent first)

III. PREVIOUS OWNER(S)			IV. REALTY OWNER(S)		
01 NAME:		02 D+B NUMBER:	01 NAME:		02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	05 CITY:	06 STATE:	07 ZIP CODE:
01 NAME:		02 D+B NUMBER:	01 NAME:		02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	05 CITY:	06 STATE:	07 ZIP CODE:
01 NAME:		02 D+B NUMBER:	01 NAME:		02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):		04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	05 CITY:	06 STATE:	07 ZIP CODE:

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State + EPA file Materials

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	D0889359 60

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P O Box, RFD #, etc)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	
08 YEARS OF OPERATION	09 NAME OF OWNER		

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME		11 D+B NUMBER	
12 STREET ADDRESS (P O Box, RFD #, etc.)		13 SIC CODE	
14 CITY	15 STATE	16 ZIP CODE	

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P O Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		
01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P O Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		
01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P O Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME		11 D+B NUMBER	
12 STREET ADDRESS (P O Box, RFD #, etc.)		13 SIC CODE	
14 CITY	15 STATE	16 ZIP CODE	
10 NAME		11 D+B NUMBER	
12 STREET ADDRESS (P O Box, RFD #, etc.)		13 SIC CODE	
14 CITY	15 STATE	16 ZIP CODE	
10 NAME		11 D+B NUMBER	
12 STREET ADDRESS (P O Box, RFD #, etc.)		13 SIC CODE	
14 CITY	15 STATE	16 ZIP CODE	

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State + EPA files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D008935960

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State + EPA files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D088935960

II. PAST RESPONSE ACTIVITIES None Known

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D088935960

II PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g. state files, sample analysis, reports)*

State + EPA files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D088935960

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY ENFORCEMENT ACTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

State + EPA files

APPENDIX

I. FEEDSTOCKS

CAS Number	Chemical Name
1. 7664-41-7	Ammonia
2. 7440-36-0	Antimony
3. 1309-64-4	Antimony Trioxide
4. 7440-38-2	Arsenic
5. 1327-53-3	Arsenic Trioxide
6. 21109-95-5	Barium Sulfide
7. 7726-95-6	Bromine
8. 106-99-0	Butadiene
9. 7440-43-9	Cadmium
10. 7782-50-5	Chlorine
11. 12737-27-8	Chromite
12. 7440-47-3	Chromium
13. 7440-48-4	Cobalt
14. 1317-38-0	Cupric Oxide
15. 7758-98-7	Cupric Sulfate
16. 1317-39-1	Cuprous Oxide
17. 74-85-1	Ethylene
18. 7647-01-0	Hydrochloric Acid
19. 7664-39-3	Hydrogen Fluoride
20. 1335-25-7	Lead Oxide
21. 7439-97-6	Mercury
22. 74-82-8	Methane
23. 91-20-3	Napthalene
24. 7440-02-0	Nickel
25. 7697-37-2	Nitric Acid
26. 7723-14-0	Phosphorus
27. 7778-50-9	Potassium Dichromate
28. 1310-58-3	Potassium Hydroxide
29. 115-07-1	Propylene
30. 10588-01-9	Sodium Dichromate
31. 1310-73-2	Sodium Hydroxide
32. 7646-78-8	Stannic Chloride
33. 7772-99-8	Stannous Chloride
34. 7664-93-9	Sulfuric Acid
35. 108-88-3	Toluene
36. 1330-20-7	Xylene
37. 7646-85-7	Zinc Chloride
38. 7733-02-0	Zinc Sulfate

II. HAZARDOUS SUBSTANCES

CAS Number	Chemical Name
1. 75-07-0	Acetaldehyde
2. 64-19-7	Acetic Acid
3. 108-24-7	Acetic Anhydride
4. 75-86-5	Acetone Cyanohydrin
5. 506-96-7	Acetyl Bromide
6. 75-36-5	Acetyl Chloride
7. 107-02-8	Acrolein
8. 107-13-1	Acrylonitrile
9. 124-04-9	Adipic Acid
10. 309-00-2	Aldrin
11. 10043-01-3	Aluminum Sulfate
12. 107-18-6	Allyl Alcohol
13. 107-05-1	Allyl Chloride
14. 7664-41-7	Ammonia
15. 631-61-8	Ammonium Acetate
16. 1863-63-4	Ammonium Benzoate
17. 1066-33-7	Ammonium Bicarbonate
18. 7789-09-5	Ammonium Bichromate
19. 1341-49-7	Ammonium Bifluoride
20. 10192-30-0	Ammonium Bisulfite
21. 1111-78-0	Ammonium Carbamate
22. 12125-02-9	Ammonium Chloride
23. 7788-98-9	Ammonium Chromate
24. 3012-65-5	Ammonium Citrate, Dibasic
25. 13826-83-0	Ammonium Fluoborate
26. 12125-01-8	Ammonium Fluoride
27. 1336-21-6	Ammonium Hydroxide
28. 6009-70-7	Ammonium Oxalate
29. 16919-19-0	Ammonium Silicofluoride
30. 7773-06-0	Ammonium Sulfamate
31. 12135-76-1	Ammonium Sulfide
32. 10196-04-0	Ammonium Sulfite
33. 14307-43-8	Ammonium Tartrate
34. 1762-95-4	Ammonium Thiocyanate
35. 7783-18-8	Ammonium Thiosulfate
36. 628-63-7	Amyl Acetate
37. 62-53-3	Aniline
38. 7647-18-9	Antimony Pentachloride
39. 7789-61-9	Antimony Tribromide
40. 10025-91-9	Antimony Trichloride
41. 7783-56-4	Antimony Trifluoride
42. 1309-64-4	Antimony Trioxide
43. 1303-32-8	Arsenic Disulfide
44. 1303-28-2	Arsenic Pentoxide
45. 7784-34-1	Arsenic Trichloride
46. 1327-53-3	Arsenic Trioxide
47. 1303-33-9	Arsenic Trisulfide
48. 542-62-1	Barium Cyanide
49. 71-43-2	Benzene
50. 65-85-0	Benzoic Acid
51. 100-47-0	Benzonitrile
52. 98-88-4	Benzoyl Chloride
53. 100-44-7	Benzyl Chloride
54. [illegible]0-41-7	Beryllium
55. 7787-47-5	Beryllium Chloride
56. 7787-49-7	Beryllium Fluoride
57. 13597-99-4	Beryllium Nitrate
58. 123-86-4	Butyl Acetate
59. 84-74-2	n-Butyl Phthalate
60. 109-73-9	Butylamine
61. 107-92-6	Butyric Acid
62. 543-90-8	Cadimium Acetate
63. 7789-42-6	Cadmium Bromide
64. 10108-64-2	Cadmium Chloride
65. 7778-44-1	Calcium Arsenate
66. 52740-16-6	Calcium Arsenite
67. 75-20-7	Calcium Carbide
68. 13765-19-0	Calcium Chromate
69. 592-01-8	Calcium Cyanide
70. 26264-06-2	Calcium Dodecylbenzene Sulfonate
71. 7778-54-3	Calcium Hypochlorite
72. 133-06-2	Captan
73. 63-25-2	Carbaryl
74. 1563-66-2	Carbofuran
75. 75-15-0	Carbon Disulfide
76. 56-23-5	Carbon Tetrachloride
77. 57-74-9	Chlordane
78. 7782-50-5	Chlorine
79. 108-90-7	Chlorobenzene
80. 67-66-3	Chloroform
81. 7790-94-5	Chlorosulfonic Acid
82. 2921-88-2	Chlorpyrifos
83. 1066-30-4	Chromic Acetate
84. 7738-94-5	Chromic Acid
85. 10101-53-8	Chromic Sulfate
86. 10049-05-5	Chromous Chloride
87. 544-18-3	Cobaltous Formate
88. 14017-41-5	Cobaltous Sulfamate
89. 56-72-4	Coumaphos
90. 1319-77-3	Cresol
91. 4170-30-3	Crotonaldehyde
92. 142-71-2	Cupric Acetate
93. 12002-03-8	Cupric Acetoarsenite
94. 7447-39-4	Cupric Chloride
95. 3251-23-8	Cupric Nitrate
96. 5893-66-3	Cupric Oxalate
97. 7758-98-7	Cupric Sulfate
98. 10380-29-7	Cupric Sulfate Ammoniated
99. 815-82-7	Cupric Tartrate
100. 506-77-4	Cyanogen Chloride
101. 110-82-7	Cyclohexane
102. 94-75-7	2,4-D Acid
103. 94-11-1	2,4-D Esters
104. 50-29-3	DDT
105. 333-41-5	Diazinon
106. 1918-00-9	Dicamba
107. 1194-65-6	Dichlobenil
108. 117-80-6	Dichlone
109. 25321-22-6	Dichlorobenzene (all isomers)
110. 266-38-19-7	Dichloropropane (all isomers)
111. 26952-23-8	Dichloropropene (all isomers)
112. 8003-19-8	Dichloropropene-Dichloropropane Mixture
113. 75-99-0	2-2-Dichloropropionic Acid
114. 62-73-7	Dichlorvos
115. 60-57-1	Dieldrin
116. 109-89-7	Diethylamine
117. 124-40-3	Dimethylamine
118. 25154-54-5	Dinitrobenzene (all isomers)
119. 51-28-5	Dinitrophenol
120. 25321-14-6	Dinitrotoluene (all isomers)
121. 85-00-7	Diquat
122. 298-04-4	Disulfoton
123. 330-54-1	Diuron
124. 27176-87-0	Dodecylbenzenesulfonic Acid
125. 115-29-7	Endosulfan (all isomers)
126. 72-20-8	Endrin and Metabolites
127. 106-89-8	Epichlorohydrin
128. 563-12-2	Ethion
129. 100-41-4	Ethyl Benzene
130. 107-15-3	Ethylenediamine
131. 106-93-4	Ethylene Dibromide
132. 107-06-2	Ethylene Dichloride
133. 60-00-4	EDTA
134. 1185-57-5	Ferric Ammonium Citrate
135. 2944-67-4	Ferric Ammonium Oxalate
136. 7705-08-0	Ferric Chloride

II. HAZARDOUS SUBSTANCES

CAS Number	Chemical Name
137. 7783-50-8	Ferric Fluoride
138. 10421-48-4	Ferric Nitrate
139. 10028-22-5	Ferric Sulfate
140. 10045-89-3	Ferrous Ammonium Sulfate
141. 7758-94-3	Ferrous Chloride
142. 7720-78-7	Ferrous Sulfate
143. 206-44-0	Fluoranthene
144. 50-00-0	Formaldehyde
145. 64-18-6	Formic Acid
146. 110-17-8	Fumaric Acid
147. 98-01-1	Furfural
148. 86-50-0	Guthion
149. 76-44-8	Heptachlor
150. 118-74-1	Hexachlorobenzene
151. 87-68-3	Hexachlorobutadiene
152. 67-72-1	Hexachloroethane
153. 70-30-4	Hexachlorophene
154. 77-47-4	Hexachlorocyclopentadiene
155. 7647-01-0	Hydrochloric Acid (Hydrogen Chloride)
156. 7664-39-3	Hydrofluoric Acid (Hydrogen Fluoride)
157. 74-90-8	Hydrogen Cyanide
158. 7783-06-4	Hydrogen Sulfide
159. 78-79-5	Isoprene
160. 42504-46-1	Isopropanolamine Dodecylbenzenesulfonate
161. 115-32-2	Kelthane
162. 143-50-0	Kepone
163. 301-04-2	Lead Acetate
164. 3687-31-8	Lead Arsenate
165. 7758-95-4	Lead Chloride
166. 13814-96-5	Lead Fluoborate
167. 7783-46-2	Lead Fluoride
168. 10101-63-0	Lead Iodide
169. 18256-98-9	Lead Nitrate
170. 7428-48-0	Lead Stearate
171. 15739-80-7	Lead Sulfate
172. 1314-87-0	Lead Sulfide
173. 592-87-0	Lead Thiocyanate
174. 58-89-9	Lindane
175. 14307-35-8	Lithium Chromate
176. 121-75-5	Malthion
177. 110-16-7	Maleic Acid
178. 108-31-6	Maleic Anhydride
179. 2032-65-7	Mercaptodimethur
180. 592-04-1	Mercuric Cyanide
181. 10045-94-0	Mercuric Nitrate
182. 7783-35-9	Mercuric Sulfate
183. 592-85-8	Mercuric Thiocyanate
184. 10415-75-5	Mercurous Nitrate
185. 72-43-5	Methoxychlor
186. 74-93-1	Methyl Mercaptan
187. 80-62-6	Methyl Methacrylate
188. 298-00-0	Methyl Parathion
189. 7786-34-7	Mevinphos
190. 315-18-4	Mexacarbate
191. 75-04-7	Monoethylamine
192. 74-89-5	Monomethylamine
193. 300-76-5	Naled
194. 91-20-3	Naphthalene
195. 1338-24-5	Naphthenic Acid
196. 7440-02-0	Nickel
197. 15699-18-0	Nickel Ammonium Sulfate
198. 37211-05-5	Nickel Chloride
199. 12054-48-7	Nickel Hydroxide
200. 14216-75-2	Nickel Nitrate
201. 7786-81-4	Nickel Sulfate
202. 7697-37-2	Nitric Acid
203. 98-95-3	Nitrobenzene
204. 10102-44-0	Nitrogen Dioxide
205. 25154-55-6	Nitrophenol (all isomers)
206. 1321-12-6	Nitrotoluene
207. 30525-89-4	Paraformaldehyde
208. 56-38-2	Parathion
209. 608-93-5	Pentachlorobenzene
210. 87-86-5	Pentachlorophenol
211. 85-01-8	Phenanthrene
212. 108-95-2	Phenol
213. 75-44-5	Phosgene
214. 7664-38-2	Phosphoric Acid
215. 7723-14-0	Phosphorus
216. 10025-87-3	Phosphorus Oxychloride
217. 1314-80-3	Phosphorus Pentasulfide
218. 7719-12-2	Phosphorus Trichloride
219. 7784-41-0	Potassium Arsenate
220. 10124-50-2	Potassium Arsenite
221. [illegible]8-50-9	Potassium Bichromate
222. 7789-00-6	Potassium Chromate
223. 7722-64-7	Potassium Permanganate
224. 2312-35-8	Propargite
225. 79-09-4	Propionic Acid
226. 123-62-6	Propionic Anhydride
227. 1336-36-3	Polychlorinated Biphenyls
228. 151-50-8	Potassium Cyanide
229. 1310-58-3	Potassium Hydroxide
230. 75-56-9	Propylene Oxide
231. 121-29-9	Pyrethrins
232. 91-22-5	Quinoline
233. 108-46-3	Resorcinol
234. 7446-08-4	Selenium Oxide
235. 7761-88-8	Silver Nitrate
236. 7631-89-2	Sodium Arsenate
237. 7784-46-5	Sodium Arsenite
238. 10588-01-9	Sodium Bichromate
239. 1333-83-1	Sodium Bifluoride
240. 7631-90-5	Sodium Bisulfite
241. 7775-11-3	Sodium Chromate
242. 143-33-9	Sodium Cyanide
243. 25155-30-0	Sodium Dodecylbenzene Sulfonate
244. 7681-49-4	Sodium Fluoride
245. 16721-80-5	Sodium Hydrosulfide
246. 1310-73-2	Sodium Hydroxide
247. 7681-52-9	Sodium Hypochlorite
248. 124-41-4	Sodium Methylate
249. 7632-00-0	Sodium Nitrate
250. 7558-79-4	Sodium Phosphate, Dibasic
251. 7601-54-9	Sodium Phosphate, Tribasic
252. 10102-18-8	Sodium Selenite
253. 7789-06-2	Strontium Chromate
254. 57-24-9	Strychnine and Salts
255. 100-420-5	Styrene
256. 12771-08-3	Sulfur Monochloride
257. 7664-93-9	Sulfuric Acid
258. 93-76-5	2,4,5-T Acid
259. 2008-46-0	2,4,5-T Amines
260. 93-79-8	2,4,5-T Esters
261. 13560-99-1	2,4,5-T Salts
262. 93-72-1	2,4,5-TP Acid
263. 32534-95-5	2,4,5-TP Acid Esters
264. 72-54-8	TDE
265. 95-94-3	Tetrachlorobenzene
266. 127-18-4	Tetrachloroethane
267. 78-00-2	Tetraethyl Lead
268. 107-49-3	Tetraethyl Pyrophosphate
269. 7446-18-6	Thallium (I) Sulfate
270. 108-88-3	Toluene
271. 8001-35-2	Toxaphene
272. 12002-48-1	Trichlorobenzene (all isomers)
273. 52-68-6	Trichlorfon
274. 25323-89-1	Trichloroethane (all isomers)
275. 79-01-6	Trichloroethylene
276. 25167-82-2	Trichlorophenol (all isomers)
277. 27323-41-7	Triethanolamine Dodecylbenzenesulfonate
278. 121-44-8	Triethylamine
279. 75-50-3	Trimethylamine
280. 541-09-3	Uranyl Acetate
281. 10102-06-4	Uranyl Nitrate
282. 1314-62-1	Vanadium Pentoxide
283. 27774-13-6	Vanadyl Sulfate
284. 108-05-4	Vinyl Acetate
285. 75-35-4	Vinylidene Chloride
286. 1300-71-6	Xylenol
287. 557-34-6	Zinc Acetate
288. 52628-25-8	Zinc Ammonium Chloride
289. 1332-07-6	Zinc Borate
290. 7699-45-8	Zinc Bromide
291. 3486-35-9	Zinc Carbonate
292. 7646-85-7	Zinc Chloride
293. 557-21-1	Zinc Cyanide
294. 7783-49-3	Zinc Fluoride
295. 557-41-5	Zinc Formate
296. 7779-86-4	Zinc Hydrosulfite
297. 7779-88-6	Zinc Nitrate
298. 127-82-2	Zinc Phenolsulfonate
299. 1314-84-7	Zinc Phosphide
300. 16871-71-9	Zinc Silicofluoride
301. 7733-02-0	Zinc Sulfate
302. 13746-89-9	Zirconium Nitrate
303. 16923-95-8	Zirconium Potassium Fluoride
304. 14644-61-2	Zirconium Sulfate
305. 10026-11-6	Zirconium Tetrachloride

PRELIMINARY ASSESSMENT COVER SHEET
PRISMO UNIVERSAL CORP.
GAD088935960

I. HISTORY OF SITE

The Prismo Universal Corporation (currently known as Redland Prismo Corporation), located at 2675 Martin Street in East Point, Georgia 30344, relocated its operations to 1204 Airport Road in Ball Ground, Georgia on December 21, 1984. The facility, prior to its closing, had been in operation since 1951. The subject East Point facility is owned by Redland Prismo Corporation of Parsippany, New Jersey. The facility was used to manufacture traffic markings and industrial paints and top coats. The Part A Application for this facility was withdrawn and, prior to closure, the facility was classified as a generator of hazardous waste.

II. NATURE OF HAZARDOUS MATERIALS

Prior to closing the facility generated spent solvents (benzene, toluene), caustic liquids and paint wastes (sludge). Exact waste quantities are unknown, however two 2,500 gallon waste water tanks and two 8,000 gallon caustic waste water tanks were emptied by Barton Environmental and cleaned by Underwood Industries prior to the facility's relocation. Spent solvents were contained within 55 gallon drums in a storage area prior to disposal.

III. DESCRIPTION OF HAZARDOUS CONDITIONS, INCIDENTS, PERMIT VIOLATIONS

According to Mr. David Miller, Director of Operations for Prismo Universal Corporation (currently Redland Prismo Corporation), there were no spills to the best of his recollection. There have been numerous inspections of the facility by the Georgia EPD. Wastes generated at the site have been released via overflowing tanks in a diked area, leaking of a diked area, dumping of drum contents in a storage area resulting in wastes leaving the site, and spills of alkyd resins at an off-loading ramp.

IV. ROUTES FOR CONTAMINATION

On-site spillage of wastes resulted in wastes leaving the site via surface run-off and infiltration into soil.

V. POSSIBLE AFFECTED POPULATION AND RESOURCES

Residences in the area are served by a municipal water supply system; no wells are thought to be in the area. The population within a three mile radius of the site exceeds 250,000 due to its metropolitan area location.

VI. RECOMMENDATIONS AND JUSTIFICATIONS

This site is assessed a "Low" priority for a Site Inspection because 1) there have been numerous waste releases at the facility and 2) there has not been a final inspection of the site after all manufacturing activities were relocated to Ball Ground, Georgia.

VII. REFERENCE TO SUPPORTING DATA SOURCES

1. EPA 3510-1, 3510-3 (6/80) Form, 11/13/80.
2. Application for Hazardous Waste Facility Permit, 2/12/81.
3. Letter, 10/16/81, RE: Hazardous Waste Permit, 10/16/81.
4. Generator Hazardous Waste Reports: 1981 & 1982.
5. Memorandum, 5/12/82, RE: Storage Permit.
6. Letter, 8/12/81, RE: Formal Request for Part B Application.
7. Letter, 12/3/82, RE: Withdrawal of Part A Application for Prismo Universal Corporation.
8. Letter, 1/24/83, RE: Acknowledgement of withdrawal from Georgia EPD.
9. Trip Reports: 1/5/83, 2/14/83, 7/15/83, 8/10/83 & 2/20/85.
10. Letter, 6/30/83, RE: Notice of Violation.
11. Alabama Hazardous Wastes Manifests, 1/24/83 and 6/29/83.
12. Letter, 6/8/83, RE: Notice of Violation from Georgia EPD.
13. Georgia Annual Hazardous Waste Report, 1983.
14. Waste Management Data Sheet, 2/13/84.
15. Telephone Conversation Record, 1/10/86.

GAK/mcw011(2)

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
GA	D088935960

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Prismo Universal Corp.

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: 2675 Martin Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
East Point	GA	30344	Fulton	121	06

09 COORDINATES LATITUDE 33 37' 30.0" LONGITUDE 082 26' 37.0"

Currently: Redland Prismo Corp.

10 DIRECTIONS TO SITE (Starting from nearest public road)

The facility is located on the west side of Martin Street between East Forrest Ave. and East Ware Street.

III. RESPONSIBLE PARTIES

01 OWNER (if known): Prismo Universal Corporation

02 STREET (Business, mailing, residential): 300 Lanidex Plaza

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Parsippany	NJ	07054	(201) 884-0300

07 OPERATOR (If known and different from owner): Prismo Universal Corp.

08 STREET (Business, mailing, residential):

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
2675 Martin Street	GA	30344	(404) 479-6515

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: ______ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: ______ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☒ A. RCRA 3001 DATE RECEIVED: 11 / 13 / 80 (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __ / __ / __ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☒ YES ☐ NO DATE 1 / 24 / 83; 2 / 14 / 83; 6 15 83 (MONTH DAY YEAR)

BY (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR ☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: ______ (Specify)

CONTRACTOR NAME(S): ______

02 SITE STATUS (Check one): ☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION: 1951 (BEGINNING YEAR) | 1984 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Spent solvents (toluene, benzene), caustic paint sludge, sodium hydroxide, paint wastes, resins (alkyd).

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Possible spills from drum storage area, overflow of tanks in diked area.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☒ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency Organization)	03 TELEPHONE NUMBER
David Miller	Redland Prismo Corp.	(404) 479-6515

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Gilda A. Knowles	DNR EPD	REMEDIAL ACTION	(404) 656-7404	1 13 86 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
GA	D088935960

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER ______ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS ______

CUBIC YARDS ______

NO. OF DRUMS ______

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☒ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	unknown		paint waste (residue - tanks)
OLW	OILY WASTE			
SOL	SOLVENTS	unknown		solvents (benzene, toluene)
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SOL	toluene	108-88-3	M & M Chemical Co.		
	benzene	71-43-2	M & M Chemical Co.		
SLU	unknown (residue from tanks) paint wastes	-	SCA Services, Inc.		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Prismo Universal Corp.; East Point, GA (GA EPD STATE FILES)

EPA	POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS	I. IDENTIFICATION 01 STATE: GA 02 SITE NUMBER: D088935960

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 6-15-83) ☐ POTENTIAL ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Overflowing tanks of caustic waste, possibly entering small creek across from Norman Berry Drive.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☒ OBSERVED (DATE: 6-15-83) ☐ POTENTIAL ☒ ALLEGED
03 AREA POTENTIALLY AFFECTED: ______ (Acres) 04 NARRATIVE DESCRIPTION

Deliberate dumping of drum contents in drum storage area, spillage of alkyd resins (off-loading ramp).

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

EPA

I. IDENTIFICATION
01 STATE: GA
02 SITE NUMBER: D088935960

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______
04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: 6-15-83) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION

Deliberate dumping of drums (contents) in drum storage area, fluids running into city sewer.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

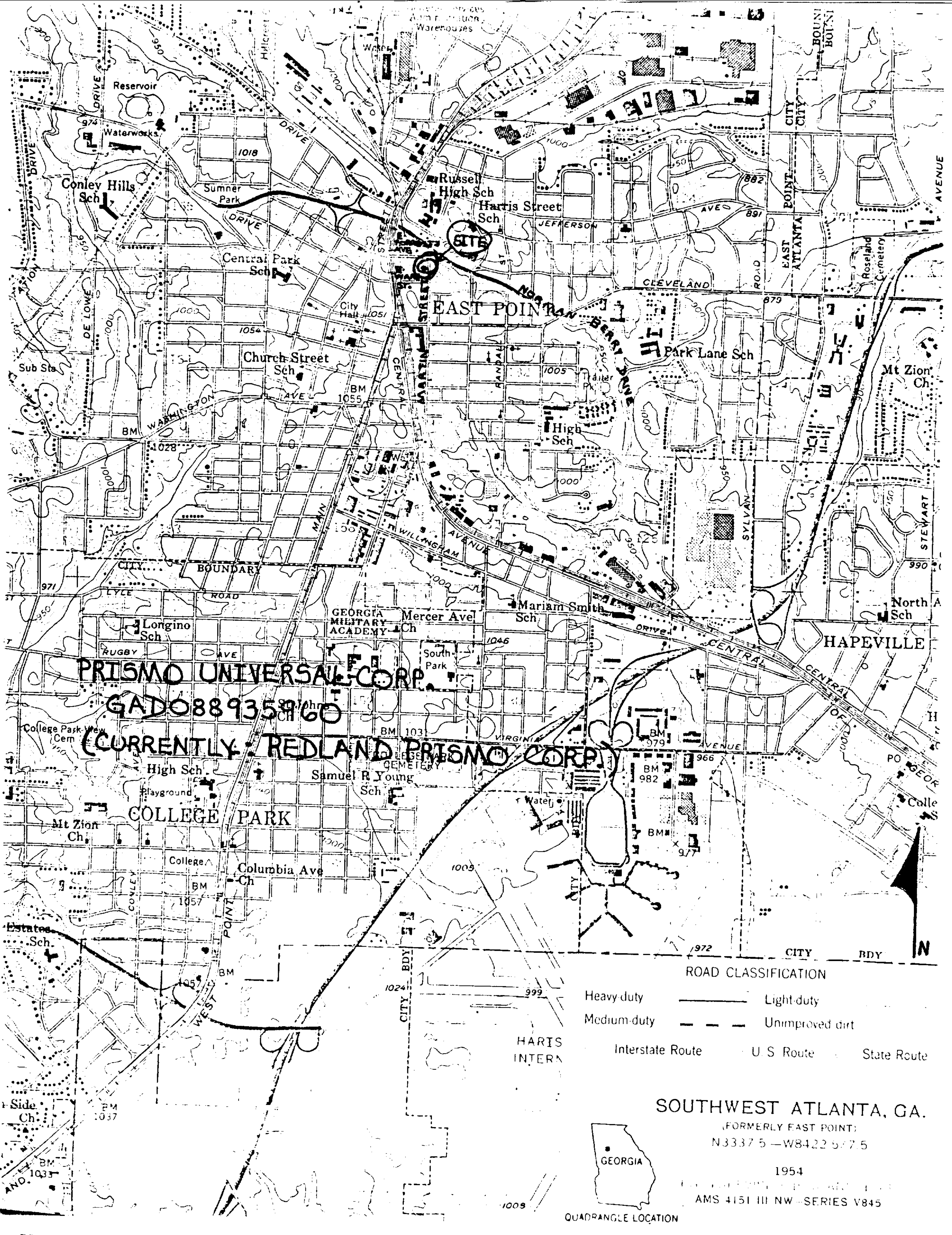
III. TOTAL POPULATION POTENTIALLY AFFECTED: 1 mile= greater than 250,000 site located in metropolitan area of city (heavily populated).

IV. COMMENTS

On June 24, 1983 - Contaminated soil adjacent to drum storage area was removed and disposed of in a permitted hazardous waste disposal site. Diked area around over-flowing tanks pumped out of excess liquid and disposed of. Diked area repaired to prevent leaks. Repairs reported completed 8-10-83 for first excavation. Still awaiting final report of closing.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

GA EPD STATE FILES
PRISMO UNIVERSAL CORP.; EAST POINT, GA



PRISMO UNIVERSAL CORP
GAD088935960
(CURRENTLY: REDLAND PRISMO CORP)
SITE
EAST POINT
COLLEGE PARK
HAPEVILLE
Conley Hills Sch
Reservoir
Waterworks
Sumner Park
Russell High Sch
Harris Street Sch
Central Park Sch
City Hall
Church Street Sch
Park Lane Sch
High Sch
Mt Zion Ch
Sub Sta
Longino Sch
Georgia Military Academy
Mercer Ave Ch
South Park
Mariam Smith Sch
North A Sch
St Johns Ch
College Park-View Cem
College Park Cemetery
Samuel R Young Sch
Playground
Columbia Ave Ch
College
Estates Sch
Warehouses
JEFFERSON
CLEVELAND
NORMAN BERRY DRIVE
WASHINGTON AVE
WILLINGHAM
CENTRAL AVENUE
CITY BOUNDARY
LYLE ROAD
RUGBY AVE
VIRGINIA AVENUE
MAIN
MARTIN STREET
EAST ATLANTA
SYLVAN
STEWART
WEST POINT
CITY BDY
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
Interstate Route
U S Route
State Route
SOUTHWEST ATLANTA, GA.
(FORMERLY EAST POINT)
N3337.5—W8422.5/7.5
1954
AMS 4151 III NW—SERIES V845
GEORGIA
QUADRANGLE LOCATION
N

Please print or type in the unshaded areas only (fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL — EPA — U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

extra copy 0224

GENERAL INSTRUCTIONS

If a preprinted label has been provided, a[ffix] it in the designated space. Review the info[rm]ation carefully; if any of it is incorrect, cr[oss] through it and enter the correct data in appropriate fill—in area below. Also, if any the preprinted data is absent *(the area to left of the label space lists the informat[ion] that should appear)*, please provide it in proper fill—in area(s) below. If the label complete and correct, you need not compl[ete] ... V, and VI (except VI-B wh[ich] ...). Complete items if no label has been provided. Refer the instructions for detailed item desc[rip]tions and for the legal authorizations un[der] which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X			F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP PRISMO UNIVERSAL CORPORATION

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 SUDDUTH, CHARLES GEN. MGR.	404 767 0564

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 P. O. BOX 90868

Harris Freeman consultant

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 EAST POINT	GA	30364

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 2675 MARTIN STREET

B. COUNTY NAME

FULTON

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 EAST POINT	GA	30344	

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST		B. SECOND	
C: 7 2851	*(specify)* PAINT, VARNISH, LACQUERS	C: 7	*(specify)*
C. THIRD		**D. FOURTH**	
C: 7	*(specify)*	C: 7	*(specify)*

VIII. OPERATOR INFORMATION

A. NAME: C 8 PRISMO UNIVERSAL CORPORATION

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)*

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

M *(specify)*

D. PHONE *(area code & no.)*: C A 201 884 0300

E. STREET OR P.O. BOX: 300 LANIDEX PLAZA

F. CITY OR TOWN	G. STATE	H. ZIP CODE
C B PARSIPPANY	NJ	07054

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*	D. PSD *(Air Emissions from Proposed Sources)*
C 9 T N: NA	C 9 T P: NA
B. UIC *(Underground Injection of Fluids)*	**E. OTHER** *(specify)*
C 9 T U: NA	C 9: NA *(specify)*
C. RCRA *(Hazardous Wastes)*	**E. OTHER** *(specify)*
C 9 T R: NA	C 9: NA *(specify)*

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

Manufacture of traffic markings, including paints and plastics, and industrial paints, including surface primers and top coats.

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
	Charles H. Sudduth, Gen. Mgr.	11/13/80

COMMENTS FOR OFFICIAL USE ONLY

C

Please print or type in the unshaded areas only (fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

EPA

ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

F GAD0989359600

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

[ ] 2. NEW FACILITY *(Complete item below.)*

C 8 — YR. 48 MO. 06 DAY 15 — FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR. __ MO. __ DAY __ — FOR NEW FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.
1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP I

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 1	25,000	G		7				
2	S 0 2	15,500	G		8				
3					9				
4					10				

Continued from the front.

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "04")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER — Enter the four—digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four—digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non—listed waste*(s)* that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each listed hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non—listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non—listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
X-1	K 0 5 4	900	P	T 0 3 / D 8 0	
X-2	D 0 0 2	400	P	T 0 3 / D 8 0	
X-3	D 0 0 1	100	P	T 0 3 / D 8 0	
X-4	D 0 0 2				included with above

 CONTINUE ON PAGE 3

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	T/A	C	FOR OFFICIAL USE ONLY	T/A	C	
W		1	W DUP		2	DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	F001	5525	P	S01	S02			
2	K078	36,000	P	S01	S02			
3	K079	42,300	P	S01	S02			
4	K081	21,600	P	S01	S02			
5	K082	50,400	P	S01	S02			
6	U002	3305	P	S01	S02			
7	U056	975	P	S01	S02			
8	U112	800	P	S01	S02			
9	U154	650	P	S01	S02			
10	U159	3000	P	S01	S02			
11	U161	100	P	S01	S02			
12	U220	18,250	P	S01	S02			
13	U226	100	P	S01	S02			
14	U239	2534	P	S01	S02			
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

Con' ued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. *(enter from page 1)*		
F	T/A	C: 6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground–level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail).*

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
82 26 37	33 37 30

VIII. FACILITY OWNER

☒ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E PRISMO UNIVERSAL CORPORATION	201-884-0300

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F 300 LANIDEX PLAZA	G PARSIPPANY	NJ	07054

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

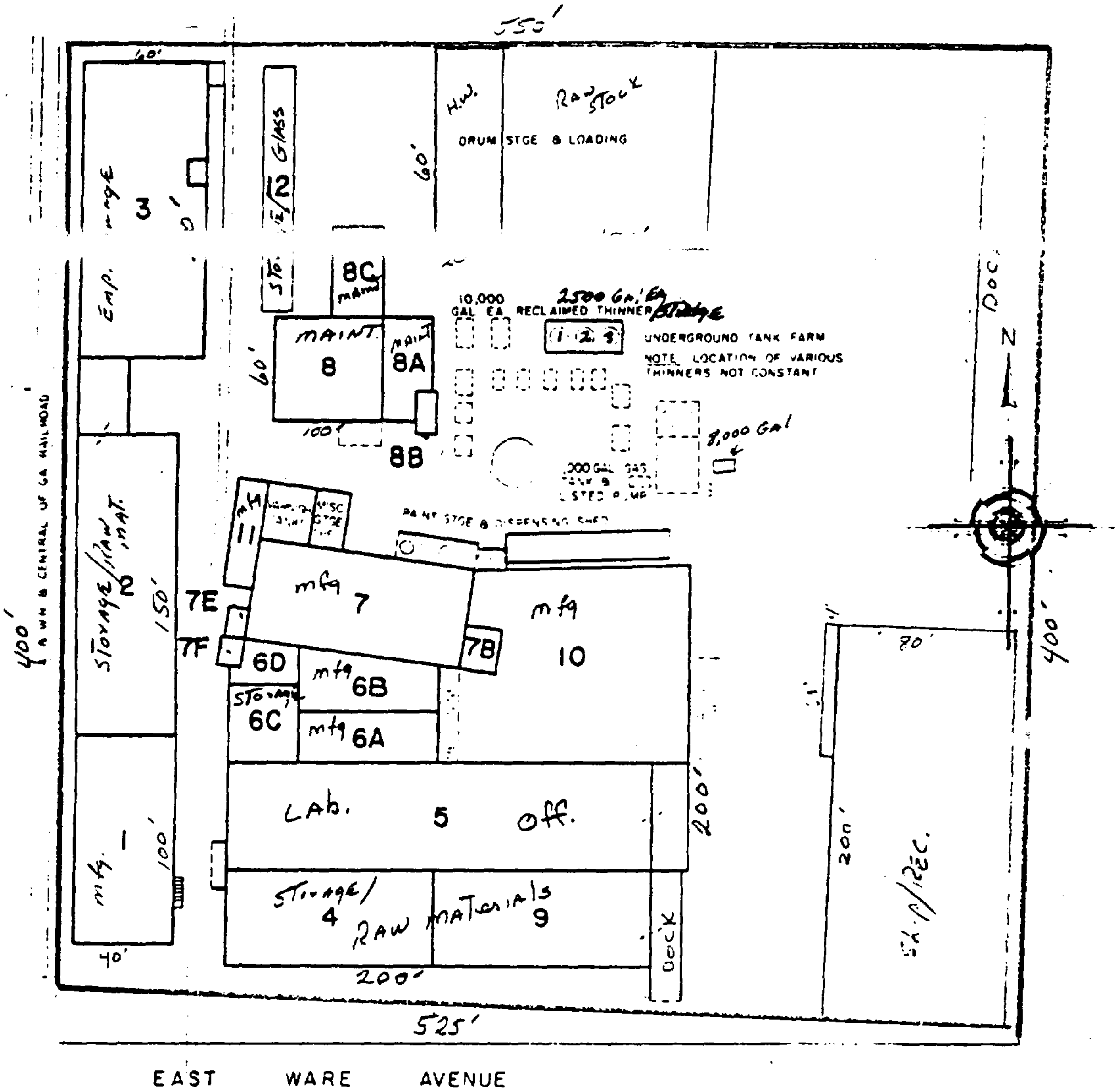
A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Robert S. Whittier	Robert S Whittier	11/13/80

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED

CONTINUE ON PAGE 5



PLAT PLAN OF

HAZARDOUS WASTE STORAGE

WILLIAM ARMSTRONG SMITH CO.

2675 MARTIN STREET

EAST POINT, GEORGIA

SCALE
0 50 100

APPRAISED BY

GRAVES & BURCHARD COMPANY

6-30-75

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

Department of Natural Resources
ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S W
ATLANTA, GEORGIA 30334

file

August 12, 1982

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Charles Sudduth
Prismo Universal
2675 Martin St.
East Point, GA 30344

RE: Prismo Universal, 2675 Martin St., East Point, GA, 30344, EPA ID #GAD088935960

Dear Mr. Sudduth:

This letter constitutes a formal request for Part B of your application for a hazardous waste facility permit under the Georgia Hazardous Waste Management Act for the above referenced facility. This request is made under the authority of Georgia Rules for Hazardous Waste Management, Chapter 391-3-11-.11(2)(a) and is applicable to the following hazardous waste handling units:

1. Tank Storage Area
2. Drum Storage Area

The State of Georgia received interim authorization for Phase I of the Hazardous Waste Program under RCRA on February 3, 1981. On May 21, 1982 Georgia received Phase II interim authorization (the permitting portion) of the Hazardous Waste Program and is, at this time, proceeding with all applicable portions of Phase I and Phase II.

Enclosed are copies of the State rules which set forth the information required in the Part B application for your facility. Send four copies of the completed Part B application to the Georgia EPD no later than 180 days from the date of this request. The mailing address of EPD is as follows:

Georgia Environmental Protection Division
270 Washington Street, S.W., Room 824
Atlanta, GA 30334
ATTN: Moses N. McCall, III

Mr. Charles Sudduth
August 12, 1982
Page Two

Should you claim any information except your name and address to be confidential, you must assert such claim by stamping the words "confidential business information" on each page containing such information. If no claim is made and substantiated at the time of submission, the information may be made available to the public without further notice. If a claim is asserted and substantiated, the information will be treated in accordance with the procedures in Section 20 of the Georgia Hazardous Waste Management Act.

Should you have any questions concerning these requirements, please contact John Taylor of the Georgia EPD 404/656-2833 to discuss the application requirements in more detail.

Sincerely,

J. Leonard Ledbetter

J. Leonard Ledbetter
Director

JLL:hbk

Enclosures

cc: James Scarbrough, USEPA
Moses N. McCall, III
File: Prismo Universal (Y)

ENVIRONMENTAL PROTECTION AGENCY

GENERATOR ANNUAL HAZARDOUS WASTE REPORT

This report is for the calendar year ending December 31, 1982

Prismo Universal Corporation
P.O. Box 90868
East Point, Ga. 30364

GENERAL INSTRUCTIONS: If you received a preprinted label attached to the mailing envelope in which this form was enclosed, affix it in the space provided. If any of the information on the label is incorrect, draw a line through it and provide the correct information in the appropriate section below. If the information is correct and complete, leave sections I, II, and III below blank. If you did not receive a preprinted label, complete all sections. REFER TO THE SPECIFIC INSTRUCTIONS CONTAINED IN THIS BOOKLET BEFORE COMPLETING THIS FORM. The information requested in this report is required by law (Section 3002 of the Resource Conservation Recovery Act).

Please print/type with elite type (12 characters per inch)

I. GENERATOR'S EPA I.D. NUMBER

T/A C

[redacted] G A D 0 8 8 9 3 5 9 6 0 [redacted]

1 2 13 14 15

II. NAME OF INSTALLATION

P R I S M O U N I V E R S A L C O R P O R A T I O N

30 69

III. INSTALLATION MAILING ADDRESS

P O S T O F F I C E B O X 9 0 8 6 8

15 16 45

Street or P.O. Box

E A S T P O I N T | G A | 3 0 3 6 4

15 16 | 41 42 | 47 51

City or Town | State | Zip Code

IV. LOCATION OF INSTALLATION (if different than section III above)

2 6 7 5 M A R T I N S T R E E T

15 16 45

Street or Route number

E A S T P O I N T | G A | 3 0 3 6 4

15 16 | 41 42 | 47 51

City or Town | State | Zip Code

V. INSTALLATION CONTACT

E D W A R D J P E S A V E N T O

15 16 45

Name (last and first)

4 0 4 – 7 6 7 – 0 5 6 4

46 55

Phone No. (area code & no.)

SIC CODE 2 8 5 1

VI. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Print/Type Name	Title	Signature of Authorized Representative	Date Signed
Edward J. Pesavento	Production Manager	E. J. Pesavento	3/15/83

Tear out here

1982 FORMS

Do not make entries in shaded areas

ENVIRONMENTAL PROTECTION AGENCY

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1982

Date rec'd: ______ Rec'd by: ______

VII. GENERATOR'S EPA I.D. NO.

T/A C

G A D 0 8 8 9 3 5 9 6 0

1 2 13 14 15

VIII. FACILITY NAME (specify facility to which all wastes on this page were shipped)

SOUTHEASTERN WASTE TREATMENT, INC.

IX. FACILITY'S EPA I.D. NO.

6 A D 0 0 0 2 2 2 0 8 3

16 28

X. FACILITY ADDRESS

P.O. Box 1697
1025 NEW SOUTH HARRIS ST.
DALTON, GA. 30720

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification numbers of all transporters whose services were used during 1982. This section to be completed only once. Do not repeat on supplemental sheets.)

SOUTHEASTERN WASTE TREATMENT, INC.
6AD000222083
G

XII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. DOT Hazard code	C. EPA Hazardous Waste No. (see instructions)		D. Amount of Waste	E. Unit of Measure
0 0 1	1	FLAMMABLE LIQUID/BENZENE /TOLUENE	0 8	F 0 0 3	F 0 0 5	1 0 6 0 8 2 0	P
0 0 2	2	WASTE CORROSIVE LIQUID NOS SODIUM HYDROXIDE	0 2	D 0 0 2		1 7 2 9 6 0	P
0 0 3	3	WASTE FLAMMABLE LIQUID NOS (BENZENE)	0 8	D 0 0 1		3 0 5 4 4 0	P
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						

Field positions printed in line 1: 32, 34, 35, 38, 39, 42, 43, 46, 47, 50, 51, 59, 60

XIII. COMMENTS (enter information by section number—see instructions)

Tear out here

File: Prismo Universal ~~Howard~~ Prismo - Y

HB 12/9

RECEIVED

DEC 3 1982

ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

Mr. Moses N. McCall, III
Chief Land Protection Branch
270 Washington Street, S. W.
Atlanta, Georgia 30334
Attention: Gwendolyn Glass

Dear Mr. McCall:

Prismo Universal is in receipt of your August 12, 1982, Part B Permit request as well as your October 18, 1982, Notice of Violation. As a result of these actions, Prismo Universal has re-evaluated its waste storage and containment procedures and have elected to ship all hazardous wastes, as listed in our Part A Permit, off-site to a permitted disposal facility. All waste products shall be stored on-site for less than 90 days.

As a result of the above-referenced procedure, Prismo Universal is requesting that our Part A Hazardous Waste Permit be withdrawn.

In order to assure compliance with appropriate RCRA and State of Georgia regulations, we are taking the following steps:

1.) All containers (drums) shall be dated in order to allow verification by state inspectors of number of days drums are stored on-site. Containers or drums shall not remain on-site more than 89 days.

2.) All tanks containing hazardous wastes shall be completely emptied every 89 days or less.

3.) All waste manifests shall be available for immediate inspection by Georgia EPD Officials. In addition, Prismo Universal shall submit copies of all waste manifests to Georgia EPD for a 6 month period beginning November 23, 1982.

It is our understanding that in withdrawing our Part A Permit and by complying with the above procedures, Prismo Universal will no longer be required to comply with the Part B Permit requirements and the Part 265 Regulations as noted in your October 18, 1982, letter.

We appreciate your cooperation in this matter and look forward to hearing from you soon.

Sincerely

Harris Friedman

Prismo Universal 767-0564

WEH:sea

cc: Mr. Bill Harris
Stottler Stagg and Associates

7

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

January 24, 1983

Mr. Harris Friedman
Prismo Universal
2675 Martin Street
East Point, GA 30344

RE: Request for Facility Status Changes for Prismo Univeral, East Point, GAD088935960

Dear Mr. Friedman:

This will acknowledge receipt of your request for withdrawal of your application for a Hazardous Waste Facility permit.

Based on the information provided, withdrawal of your application is warranted and your permit application has been placed in our inactive files.

Please be advised that withdrawal of your permit application invalidates any variance that you received to continue existing hazardous waste treatment storage or disposal during the permit review process and that based on our concurrence with your withdrawal request, the Federal Environmental Protection Agency will terminate your facility's interim status.

Should you wish to treat, store, or dispose of hazardous waste in the future, it will be necessary that a hazardous waste handling permit be issued, prior to the construction of such facilities, under authority of Section 8 of the Georgia Hazardous Waste Management Act and paragraphs .10 and .11 of Georgia's Rules for Hazardous Waste Management, Chapter 391-3-11.

If further clarification is needed on this matter, please feel free to contact Ms. Gwendolyn Glass at 404/656-2833.

Sincerely,

John D. Taylor, Jr.

John D. Taylor, Jr.
Program Manager
Industrial & Hazardous Waste
Management Program

JDT:ggk:2178C
cc: James H. Scarbrough
Moses N. McCall, III
File: Prismo Universal (Y)

7

Department of Natural Resources

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

R

TRIP REPORT

January 24, 1983

Site Name & Location: Prismo Universal, 2675 Martin St., East Point, GA 30344

Trip By: Gwen Glass GG

Date of Trip: 1-5-83

Officials Contacted: Harris Friedman
Edward Pesavento, Production Mgr.

Reference: Request to withdraw Part A and follow-up inspection.

Comments:

1. Inspection of Prismo was conducted to certify proper handling of hazardous waste in drum storage area. Approximately 100-125 drums were on site.
2. Accumulation dates ranged from 11-24-82 - 1-5-83. Over 50% of drums were dated 1-4-82, approx. 25% dated 12-16 & 17.
3. I feel the dates are not accurate since I observed 2 men pasting labels on drums throughout the storage area as I was waiting in the car before the inspection.
4. Southeastern Waste has been disposing of drummed waste in the past.

Conclusions:
Should re-inspect in 6 months without prior notice.

Recommendations & Follow-Up Required:
Send letter approving withdrawal.

Photographs: yes

Reviewed By: HD

Attachments: None

GG:bpk:2177C

File: Prismo Universal (R)

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

June 15, 1983

TRIP REPORT

Site Name and Location: Prismo - Universal, East Point, GA

Trip by: Gwen Glass

Accompanied by: Bert Langley

Date of Trip: February 14, 1983

Officials Contacted: Mr. Edward Pesavento, Mr. Harris Friedman

Reference: Complaint #

Comments:

Inspected this facility reference a complaint from a (b) (6). He reported this observation was made on Saturday, June 15, 1983. Apparently drums were deliberately being dumped in drum storage area and running into city sewer. Upon inspection of this facility, not only had drums been dumped but also a continous flow of caustic was running into the sewer. Two (2) tanks were over flowing into diked area. Several bricks had been removed from diked area and the caustic was continually flowing down the property into a manhole on Martin Street. Friedman insisted that this was not a waste and that this caustic was reused. This caustic process had not been diccussed during previous inspections. Mr. Lyle, manufacturing Manager said the waste was going from the manhole across Norman Berry into a little creek. Time did not allow us to find this site.

A sample was collected on the same date but results are not yet available.

Conclusions:

Facility is in violation of Rules and Regulation. Facility is possibly in violation of Water Quality Rules and Regulation.

Recommendations and Follow-up Required:

Write letter citing violations and and advise prismo to cease said violations.

Photographs:

Reviewed by: 6/28

Attachments:

GGb:322

File: Prismo(R)

Prismo File R

Redland Prismo

RECEIVED

JUL 05 1983

ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

June 30, 1983

Ms. Gwendolyn Glass
Department of Natural Resources
Environmental Protection Division
270 Washington Street, S.W.
Atlanta, Georgia 30334

Re: Notice of Violation Dated June 8, 1983

Dear Ms. Glass:

The contaminated soil adjacent to the drum storage area has been removed and disposed of in a permitted hazardous waste disposal site.

Attached are copies of both truck loads that left on June 24, and June 29, 1983.

In regards to the other items noted, we have:

1. Pumped out the excess liquid from within the diked area.

2. Set up a daily inspection by the operator, to visually determine if the tanks are close to overflowing and to see if there are any leaks at the tanks or the dike itself.

3. Jim Lyle, maintenance supervisor, has ordered the necessary items for a high level alarm system, that will be installed on top of our tanks as soon as it arrives.

4. Presently, Jim Lyle is also determining as to the best method of repairing the leak at the dike. This will be corrected as soon as the "outside" contractors give him the requested information.

Due to the nature of the repairs, I hereby request an additional 45 days to complete them, so we will be in full compliance. Your cooperation in this matter will be appreciated.

Sincerely,

Edward J. [illegible]

Edward J. [illegible]
Production Manager

[illegible]/pm

cc: J. [illegible]

ALABAMA HAZARDOUS WASTE MANIFEST

CWMA No. 73312

IDENTIFICATION INFORMATION

	NAME	ADDRESS	PHONE	EPA ID CODE
GENERATOR	[illegible]	2675 MARTIN ST. [illegible]	404 [illegible]	[illegible]
TRANSPORTER NO. 1	[illegible]	PO BOX 1163 [illegible]	[illegible]	[illegible]
TRANSPORTER NO. 2				
DISPOSER	Chemical Waste Management, Inc. Emelle Facility	P. O. Box 55 Emelle, Alabama 35459	205-652-9531	ALD000622464

WASTE INFORMATION

CONTAINER NO.	CONTAINER TYPE	DESCRIPTION/CLASS	TOTAL QUAN.	UNIT	EPA Hazardous Waste ID No.	CWMA WASTE CODE	WEIGHT
[illegible]	[illegible]	HAZARDOUS WASTE SOLID NOS [illegible]			N/A	[illegible]	

EMERGENCY INFORMATION

EMERGENCY NOS.: DISPOSER — (205) 652-9531 ; GENERATOR —(404) [illegible] US COAST GUARD 1-800-424-8802

SPECIAL INSTRUCTIONS:

CERTIFICATION

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation, the U.S. Environmental Protection Agency:

[illegible] Generator — [illegible] Title — [illegible] 83 Date

This is to certify acceptance of the hazardous waste shipment described above:

Transporter #1 — Title — Date

Transporter #2 — Title — Date

This is to certify acceptance of the hazardous waste shipment described above for treatment, storage or disposal:

Disposer — Title — Date

DISPOSAL INFORMATION

CWMA WASTE CODE	QUANTITY	UNIT	PROCESS CODE	LOCATION TRENCH	LOCATION LEVEL	LOCATION QUAD	COMMENTS

ALABAMA
HAZARDOUS WASTE MANIFEST

CWMA
No 73857

IDENTIFICATION INFORMATION

	NAME	ADDRESS	PHONE	EPA ID CODE
GENERATOR	[illegible] Corp	2675 [illegible] St, East Point [illegible]	404/767/0844	[illegible]
TRANSPORTER NO. 1	Oil [illegible] Co.	PO Box [illegible], Columbia, Tenn. [illegible]	[illegible]4999	TND[illegible]
TRANSPORTER NO. 2				
DISPOSER	Chemical Waste Management, Inc. Emelle Facility	P. O. Box 55 Emelle, Alabama 35459	205-652-9531	ALD000622464

WASTE INFORMATION

CONTAINER NO.	CONTAINER TYPE	DESCRIPTION/CLASS	TOTAL QUAN.	UNIT	EPA Hazardous Waste ID No.	CWMA WASTE CODE	WEIGHT
1	[illegible]	[illegible] Waste [illegible] Spent Residue [illegible]				[illegible]	

EMERGENCY INFORMATION

EMERGENCY NOS.: DISPOSER — (205) 652-9531 ; GENERATOR — (404) 767-0844 US COAST GUARD 1-800-424-8802

SPECIAL INSTRUCTIONS:

CERTIFICATION

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation, the U.S. Environmental Protection Agency:

[illegible signature] — Generator | [illegible] — Title | [illegible] — Date

This is to certify acceptance of the hazardous waste shipment described above:

[illegible signature] — Transporter #1 | [illegible] — Title | [illegible] — Date

Transporter #2 | Title | Date

This is to certify acceptance of the hazardous waste shipment described above for treatment, storage or disposal:

Disposer | Title | Date

DISPOSAL INFORMATION

CWMA WASTE CODE	QUANTITY	UNIT	PROCESS CODE	LOCATION TRENCH	LOCATION LEVEL	LOCATION QUAD	COMMENTS

File

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET S W
ATLANTA, GEORGIA 30334

June 8, 1983

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Edward J. Pesavento
Production Manager
Prismo Universal
2675 Martin Street
East Point, GA 30364

RE: Notice of Violation

Dear Mr. Pesavento:

The Environmental Protection Division received a complaint on February 2, 1983 in regard to improper disposal of hazardous waste at Prismo Universal. Ms. Gwendolyn Glass and Mr. Bert Langley, both of this Division, investigated the complaint on February 14, 1983, took samples and confirmed the complainants allegations by noting a continuous discharge of caustic sludge into a manhole adjacent to your hazardous waste storage facility. This activity constitutes violation of Georgia's Hazardous Waste Management Act of 1979, and the Rules for Hazardous Waste Management, Chapter 391-3-11.

The following violations were noted:

391-3-11-.10, 40 CFR 265.192(d) General operating requirements because tank is not equipped with a means to stop the inflow of hazardous waste and consequently gross amounts of waste were overflowing into diked areas.

391-3-11-.10, 40 CFR 265.194(a)(1) Inspections because owner or operator failed to inspect discharge control equipment at least once each operating day, to insure that it is in good working order.

391-3-11-.10, 40 CFR 265.194(a)(3) Inspections because owner or operator failed to check level of waste in tank at least once each operating day to insure compliance with 265.192(c).

391-3-11-.10, 40 CFR 265.194(a)(4) Inspections because owner or operator failed to inspect construction materials of the tank at least weekly to detect leaks.

391-3-11-.10, 40 CFR 265.194(a)(5) Inspections because owner or operator again failed to inspect construction materials of dikes at least weekly to detect obvious signs of leakage.

391-3-11-.10, 40 CFR 265.15(c) General inspection requirements because owner or operator failed to correct above referenced malfunctions before waste was released to the environment.

Mr. Edward J. Pesavento
Prismo Universal
June 8, 1983
Page Two

Further, the contaminated soil adjacent to the drum storage area needs your immediate attention. The subject area must be excavated to remove all contamination and must be properly disposed of in a permitted hazardous waste disposal site.

Of course, it is the responsibility of the Division to insure the protection of the public health, safety, and well being of its citizens, and to protect the quality of Georgia's environment through proper management of hazardous waste. Therefore, you are required to make necessary changes to bring your facility back in compliance. Please submit documenting information to verify that you have properly disposed of subject waste and that other violations are corrected by June 21, 1983.

If further assistance is needed reference this matter, please contact Ms. Gwendolyn Glass at 404/656-7802.

Sincerely,

John D. Taylor, Jr.
Program Manager
Industrial & Hazardous Waste
Management Program

JDT:ggk:0295M

File: Prismo (R)

file

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

TRIP REPORT
July 20, 1983

SITE NAME & LOCATION:	Prismo Universal, 2675 Martin Street P.O.Box 90868, East Point, Georgia 30364 Phone: 767-0564
TRIP BY:	Ed Cook, Environmental Specialist EC
ACCOMPANIED BY:	None
DATE OF TRIP:	July 15, 1983
OFFICIALS CONTACTED:	Mr. Edward Pesavento, Production Manager
REFERENCE:	Report of hazardous waste dumping received via Emergency Response telephone on 7-15-83.

COMMENTS:

1. This company was visited as a result of a report received on Emergency Response telephone. A (b) (6) reported that the company was dumping flammable resins on the south side of its property.

2. Upon my arrival, I inspected the periphery of the company to determine if there was any obvious dumping. Other than several apparently damaged drums stacked along the fence (Photo No. 1) on Forrest Street, there was no other evidence of waste material.

3. I met with Mr. Pesavento, explained the purpose of my visit, and requested to inspect the plant. Mr. Pesavento stated he had heard some rumor earlier about this matter and then directed me to their tanker truck off-loading area. This area on the south-west side of the facility is where tanker trucks off-load alkyd resins used in Prismo's processes. The plant chemist explained these resins are formed by reacting ethylene glycol or glycerol with phthalic anhydride then solvents (up to 40%) are added. These materials are used in exterior paints.

4. A tanker, placarded with the number 1866 in a red background (Resin solution), was off-loading (Photo #2). Transfer hoses connected at the truck were observed to be dripping material on the ground (Photo #3). Previous spillage was very apparent. The truck driver had placed a piece of cardboard over a puddle to protect his hose (Photo #4). Soil in the immediate vicinity was saturated with this resinous material which had solidified to form a sponge-like consistency. Pipe connections at the

building were not leaking at the time (Photo #5) but there was evidence to show where previous leakage had flowed around the corner of the building (Photo #6).

5. Mr. Pesavento explained some of the drivers had complained the off-loading area was getting soggy and the drivers were concerned about getting stuck. Prismo had plans to correct this situation by covering the area with crushed stone.

6. I advised Mr. Pesavento that this waste resin probably contained some amount of residual solvents and thus the waste resin and contaminated soil must be excavated and managed as a hazardous waste.

CONCLUSIONS:

1. Over an undetermined time period, alkyd resins (some containing up to 40% solvent) have been spilled on the ground while off-loading the material at Prismo.

2. Waste liquid resin is a hazardous waste (HW # D001). However, upon "setting up", the majority of the solvent present volatilizes.

3. Prismo Universal agreed to take steps to remove the waste resin and contaminated soil and manage it as hazardous waste.

RECOMMENDATIONS:

1. Send Prismo a compliance status letter giving them a deadline of no more than 15 days to clean up this area.

2. Recommend in compliance status letter that Prismo alleviate this problem by constructing a berm concrete off-loading pad where spills that occur during loading can easily and immediately be cleaned up.

PHOTOS: 6

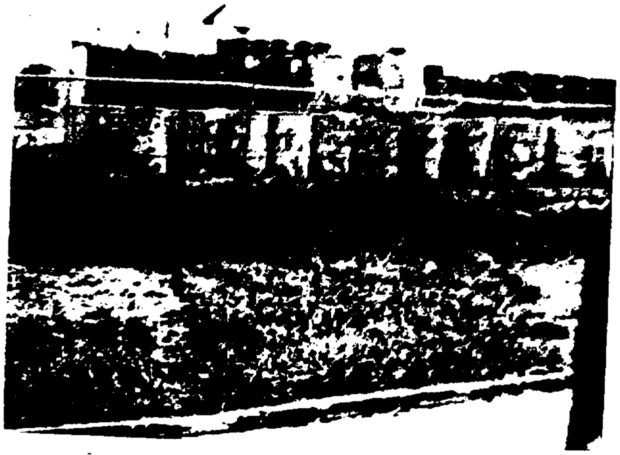
ATTACHMENTS: None

REVIEWED BY: [illegible]

FILE: Prismo Universal, East Point (R)

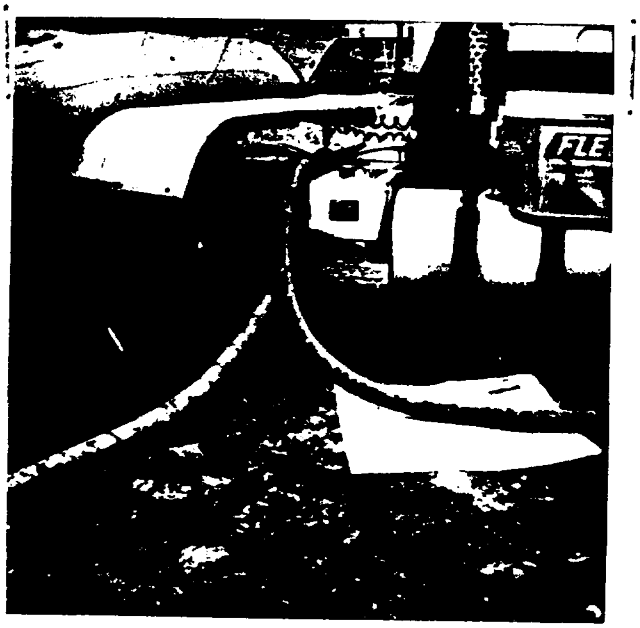
EC:mg:2421B

Prisme Universal



1

2



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6

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

TRIP REPORT
August 10, 1983

SITE NAME & LOCATION: Prismo Universal

TRIP BY: Gwendolyn Glass

DATE OF TRIP: August 8, 1983

OFFICIALS CONTACTED: Ed Pesevanto - Production Manager

REFERENCE: Follow-up Inspection

COMMENTS:

Reference letter of June 30, 1983, from Mr. Pesavento. He indicated that everything required in NOV of June 8 had been corrected except the alarm system and the dike repair and asked for an extension.

On August 8, 1983, inspection confirmed the above referenced items and in addition, the dike had been repaired. Prismo has until August 22, 1983, to complete all repairs and will at that time be in compliance.

CONCLUSIONS:

Additional action required.

RECOMMENDATIONS:

Receive letter documenting that all repairs have been made.

GG:mb:2548B

SIC CODE [illegible]
[illegible]

[illegible] - Valerie

Georgia Environmental Protection Division
GEORGIA ANNUAL HAZARDOUS WASTE REPORT
Reporting Period January 1 thru December 31, 1983
FORM A
IDENTIFICATION

FEB 21 1984
ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

Please print/type with Elite type (12 characters per inch)

I. EPA I.D. NUMBER GAD088935960 (seg. no. 00820)

II. NAME OF INSTALLATION Prismo Universal Corp.
REDLAND PRISMO CORPORATION

III. INSTALLATION MAILING ADDRESS

P. O. BOX 90868
Street or P.O.Box

City or Town	State	Zip Code
East Point	GA	30364

IV. LOCATION OF INSTALLATION (if different than Section III. above)

2675 Martin Street
Street or Route Number

City or Town	State	Zip Code
East Point,	GA	30344

Fulton
County

V. INSTALLATION CONTACT

Pesavento, Ed
Name (last and first)

404-767-0564
Phone No. (Area code & number)

VI. PROCESS IN USE (Check as appropriate)

SQG	GEN	TRN	T01	T02	T03	T04	S01	S02	S03	S04	D80	D81	D83
	X												

X PRIVATE (Handle only self generated waste)
__ COMMERCIAL (Handle waste generated from other sources)

VII. CERTIFICATION - I certify under penalty of Law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information. I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Print/Type Name & Title	Signature of Authorized Representative	Date Signed
Ed Pesavento, Production Manager	[signature]	2/15/84

Greg Underwood
615/894-3795 Chattanooga
[illegible]

Name of Installation: REDLAND PRISMO CORP. **Form B**

EPA I.D. Number: GAD088935960

SELF-GENERATED HAZARDOUS WASTE AND ITS DISPOSITION

1. EPA HAZARDOUS WASTE NUMBER	D001		D002	~~ORME~~ D000		TOTAL
2. On Hand, On-site on January 1, 1983	16.15		23.32			39.47
3. Generated during 1983	224.42		414.49	~~74.71~~		638.71 ~~713.62~~
4. TOTAL AMOUNT FOR WHICH TO ACCOUNT	240.57		437.81	~~74.71~~		678.38 ~~753.09~~
5. Shipped to State of Tennessee (Stauffer)	31.59					31.59
6. Shipped to State of Alabama (CWM)			416.84	~~74.71~~		416.84 ~~491.55~~
7. Shipped to State of						
8. Shipped to State of						
9. Shipped to Georgia Facility for Use, Reuse, Recycle or Reclaim						
10. Shipped to Georgia Facility for Treatment, Storage, or Disposal (Tri-State)	195.54					195.54
11. Treated On-site None						
12. Treatment Code None						
13. Disposed of On-site None						
14. Disposal Code None						
15. On Hand, On-site on December 31, 1983	13.44		20.97			34.41
16. Storage Code	S01		S02			
17. Other (Explain)						
18. TOTAL AMOUNT OF DISPOSITION	240.57		437.81	~~74.71~~		678.38 ~~753.09~~

Is this waste hazardous and should it be counted? No. Do not count. JMD

6/11/84 Greg Underwood stated 74.71 tons of ORME was not hazardous by definition, but was disposed of as one. He will

DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

WASTE MANAGEMENT DATA SHEET

RECEIVED

FEB 13 1984

MUNICIPAL SOLID WASTE

NAME AND LOCATION OF FACILITY

GAD 088935960

Redland Prismo Corporation
2675 Martin Street
East Point, Georgia 30344

PERSON TO CONTACT
(ENTER THE NAME, ADDRESS, TITLE AND BUSINESS TELEPHONE NUMBER OF THE PERSON TO CONTACT REGARDING INFORMATION SUBMITTED ON THIS FORM).

Edward J. Pesavento, Production Manager
Redland Prismo Corporation
2675 Martin Street
East Point, Georgia 30344 (404) 767-0564

479-6515

DATES OF WASTE HANDLING
(ENTER THE YEARS THAT YOU ESTIMATE WASTE TREATMENT, STORAGE OR DISPOSAL BEGAN AND ENDED AT THE SITE. IF YOU SELECTED A FACILITY OFF-SITE PLEASE NOTE AND EXPLAIN IN "COMMENTS" SECTION.

Prismo acquired facility April 3, 1978 - Disposal is ongoing.

GENERAL TYPE OF WASTE

1- ( ) ORGANICS
2- ( ) INORGANICS
3- (X) SOLVENTS
4- ( ) PESTICIDES
5- (X) HEAVY METALS
6- ( ) ACIDS
7- (X) BASES
8- ( ) PCB's
9- ( ) MIXED MUNICIPAL WASTE
10- ( ) UNKNOWN
11- ( ) OTHER (SPECIFY)

WASTE QUANTITY (ESTIMATED)

700 Tons Annually

HAS THERE EVER BEEN A SPILL OR DISCHARGE OF A HAZARDOUS SUBSTANCE FROM YOUR FACILITY? (BRIEFLY EXPLAIN THE NATURE OF THE RELEASE).

One of two waste caustic tanks overflowed and leaked out from under diked area. This occurred approximately February 1, 1983.

Dike repaired, overflow alarms installed and contaminated soil removed to a permitted waste disposal site.

COMMENTS

(IF THERE IS ANY COMMENTS THAT YOU BELIEVE WOULD CLARIFY THE PAST WASTE HANDLING PRACTICES OF YOUR FACILITY OR OF FACILITIES YOU SELECTED TO HANDLE YOUR WASTE, PLEASE ELABORATE IN THE SPACE PROVIDED).

Material presently being shipped to Chemical Waste Management, Tri State Steel Drum and Stauffer Chemical

SIGNATURE AND TITLE

Edward J. Pesavento	404-767-0564
NAME	TELEPHONE

2675 Martin Street
STREET

East Point	GA	30344
CITY	STATE	ZIP CODE

Edward J. Pesavento	2/10/84
SIGNATURE	DATE

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET S W
ATLANTA, GEORGIA 30334

Commissioner

J. LEONARD LEDBETTER
Division Director

March 19, 1985

FILE COPY

TRIP REPORT

Site Name and Location:.............. Prismo Universal
East Point, Georgia

Trip By:............................ Gwen Glass GG

Accompanied By:.................. None

Date of Trip:........................ February 20, 1985

Officials Contacted:................. David Miller
Operations Manager

Reference: .... Follow-up Inspection

Comments:

Inspection of this facility was delayed due to relocation. Company is closing down operation in East Point and has moved to Canton, Georgia. (Old Cherokee Safety Facility). The office actually closed on December 21, 1984 and the last day of paint manufacturing was October 24, 1984. The following areas were inspected:

1) The two - 2500 gallon waste water tanks were emptied by Barton Environmental and cleaned by Underwood Industries. Tanks will eventually be moved to Canton.

2) The two - 8000 gallon caustic waste water tanks were emptied by Barton Environmental. Tanks will probably be sold to salvage company. This area is diked and previously contained lots of spillage. Will confirm that pit is concrete and if not, soil will need to be excavated and tested for proper disposition.

3) Building 2 was full of raw materials and finished goods. Plans to move this material to Canton within the next sixty (60) days.

4) Building 1 contained some finished goods and raw product. Will also be moved to Canton. A large heap of calcium carbonate was on ground outside Building 2, as a result of emptying the tank. This will have to be removed and properly disposed of.

5) Building 3 contained twenty-four (24) drums of pebbles. Previously Crack Filling Operation. Also about twelve (12) 55-gallon drums were filled with 1/2 pint cans of obsolete crack filling, about six (6) 5-gallon cans - all to be used at Canton.

6) Tank Farm (Six tanks) raw alkyd resins will be sold to Dyabond.

7) Building 8 was previously the maintenance department and about seven (7) 55-gallon drums of high detergent oil was still on site. Plans are to move to Canton also.

8) The two 2500 gallon tanks; one waste solvent tank and one waste water, had been emptied, but lots of residue was spilled on the ground and in the diked area.

Conclusion:

1) Prismo must excavate the pit and properly close the area around the waste solvent tanks and the caustic waste tank.

2) Must verify that the diked area around the 2 - 8000 gallon caustic waste water tanks is all concrete.

3) Must provide complete manifest to verify proper disposition of all waste.

Recommendations and Follow-Up Requried:

Send letter and conduct follow-up in June or before.

Reviewed By: .... George [signature] 3-22-85

Attachments:.......................... None

GG:ed (4166B)

PRELIMINARY ASSESSMENT
TELEPHONE CONVERSATION RECORD

Site Name: Prismo Universal Corp. (CURRENTLY Redland Prismo Corp.) I.D.# GAD

Location Address: New Address - 1204 Airport Road; Ball Ground, Ga. 30107
Old Address - 2675 Martin Street; East Point, Ga. 30344

Phone: (404) 479 - 6515.

Contact: Mr. David Miller Title: Director of Operation

Address: 1204 Airport Road; Ball Ground, Ga. 30107

Phone: (404) 479 - 6515.

Authority: Section 3012 of CERCLA, Comprehensive Environmental Response, Compensation and Liability Act.

Facility has notified EPA via - RCRA 3001 site is in HWDMS
CERCLA 103c site is in NOTIS

Need Information concerning waste generation and disposal prior to Nov. 19, 1980.

How long has facility been in operation? 1951

What kind of wastes were generated and how much?

1.) caustic liquid (potassium hydroxide. 2) caustic solution plus spent solvents (cleaning of tanks 3) paint wastes (turn over page-back)

Was it disposed on site and where?

Wastes were never disposed of onsite.

Was it transported offsite and where?

Was it treated and how?

Wastes were never treated on site

Have there been any past spills? Describe.

No spills to the best of his recollection. Drains on site were sealed, prior to the company's operation (over on back)

Date of call: 1-10-86 Time: 1:00 PM Spoke with Mr. Miller said he would get back to me Monday or Tuesday (13,14) with answers to amount generated and where wastes were transported off-site

1-13-86 ---------- 3:15 PM - Left Message
1-13-86 3:45 Mr. Miller said that he would get back to me this week.

However, prior to moving to Ball Ground, Ga., 2,000 lbs of dirt was removed from around diked area.

Department of Natur— Resources

ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334
(404)656-2833

COUNTY ______
NAME ______
DATE RECEIVED ______
For EPD Use Only

RECEIVED
FEB 13 1981
LAND PROTECTION BRANCH

APPLICATION
FOR
HAZARDOUS WASTE FACILITY PERMIT

INSTRUCTIONS: (see back)

Please type or print.

I. STATUS OF OPERATION [X] Existing [ ] New(Operation projected to begin __/__/ mo day

II. TYPE OF OPERATION

A. Storage [A] Containers [ ] Surface Impoundment

B. Treatment [A] Tank [ ] Incinerator [ ] Surface Impoundment

[ ] Reclamation Recycling [ ] Other ______

C. Disposal [ ] Land Application [ ] Landfill

[ ] Surface Impoundment [ ] Other ______

III. DESCRIPTION OF WASTES TO BE HANDLED *(Use EPA Hazardous Waste No. & Description)*
K078 Solvent Cleaning Waste from Paint Manufacturing.
K079 Water or Caustic Cleaning Wastes from Equipment & Tank Cleaning From Paint Manufacturing.

IV. LOCATION OF OPERATION *(Describe below, and attach a U.S.G.S. map indicating location of the site or facility.)*

2675 Martin Street, East Point, Georgia 30344

V.

Prismo Universal Corporation	Prismo Universal Corporation
Owner's Name	Operator's Name
300 Lanidex Plaza	2675 Martin Street
Owner's Address	Operator's Address
Parsippany, N.J. 07054	East Point, Georgia 30344
(201) 884-0300	(404) 767-0564
Owner's Telephone #	Operator's Telephone #

VI. CERTIFICATION: *I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.*

AUTHORIZED REPRESENTATIVE (Name and Title) C. H. Sudduth, General Manager

MAILING ADDRESS P.O. Box 90868, East Point, Georgia 30344

SIGNATURE C H Sudduth DATE 2/12/81 TELEPHONE # 767-0564

Prismo

PRISMO UNIVERSAL CORPORATION

2675 Martin Street • P.O. Box 90868

East Point, Georgia 30364

Telephone (404) 767-0564

October 16, 1981

EPA Region IV
RCRA Activities
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: Application for a Hazardous Waste Permit
EPA I.D. No.: GAD088935960

Dear Sirs:

Enclosed you will find a business card of Mr. Charles H. Sudduth, General Manager/Vice President of Prismo Universal Corporation.

At the time Mr. Sudduth signed General Information Form #1 he was functioning in the capacity of Vice President and therefore met the qualifications for certification under 40 CFR Part 122 policy statement dated August 6, 1980.

Thank you for your attention and cooperation.

Respectfully,

PRISMO UNIVERSAL CORPORATION

Ray Robertson
Production Manager

RR/pb

enclosures

Do not make entries in sh[illegible] areas

ENVIRONMENTAL PROTECTION AGENCY

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1981.

Date rec'd: Rec'd by:

VII. GENERATOR'S EPA I.D. NO.

FAC

G 6 A D 0 8 8 9 3 5 9 6 0 1 1

1 2 13 14 15

VIII. FACILITY NAME (specify facility to which all wastes on this page were shipped)

SCA, Service, Inc.

IX. FACILITY'S EPA I.D. NO.

F S C D 0 7 0 3 7 5 9 8 5

16 28

X. FACILITY ADDRESS

Route 1
P.O. Box 55
Pinewood, SC 29125

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification numbers of **all** transporters whose services were used during 1981. **This section to be completed only once. Do not repeat on supplemental sheets.**)

Bryson Industrial Service - SCD000822312
M&M Chemical Company Inc. - ALD070513767

XII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. DOT Hazard code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
0001 (32)	1	Caustic Paint Sludge NOS ORM-E NA9189	02 (33 34)	D002 (35 38 39 42 / 43 46 47 50)	311140 (51 59)	P (60)
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					

XIII. COMMENTS (enter information by section number—see instructions)

Tear out here

Do not make entries [illegible]

ENVIRONMENTAL PROTECTION AGENCY

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1981.

Date rec'd [illegible] Rec'd by: [illegible]

VII. GENERATOR'S EPA I.D. NO.

T/A C

G G A D 0 8 8 9 3 59 6 0 11

VIII. FACILITY NAME (specify facility to which all wastes on this page were shipped)

M & M Chemical Company, Inc.

IX. FACILITY'S EPA I.D. NO.

F A L D 0 7 0 5 13 7 6 7

X. FACILITY ADDRESS

P.O. Box 291
Gadsden, Alabama 35902

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification numbers of all transporters whose services were used during 1981. **This section to be completed only once. Do not repeat on supplemental sheets.**)

XII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. DOT Hazard code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
0001	1	Waste Solvent & Paint	08	D001	892 40	P
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					

XIII. COMMENTS (enter information by section number—see instructions)

Tear out here

File:

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

May 12, 1982

MEMORANDUM

TO: Howard L. Barefoot, Unit Coordinator
Industrial & Hazardous Waste Management Program

FROM: Gwendolyn C. Glass, Environmental Specialist
Industrial & Hazardous Waste Management Program

SUBJECT: Prismo Universal, East Point, GAD08893596

The above mentioned facility submitted an application for a storage permit for hazardous waste. Based on info on file and an inspection of this facility on 5/10/82, it is recommended that interim status be granted.

bpk

OVERSIZED

DOCUMENT

M.2 - SITE MAINTENANCE FORM

* ACTION: _ *

EPA ID : GAD088935960

SITE NAME: PRISMO UNIVERSIAL CORP SOURCE: H * ______ _ *

STREET : 2675 MARTIN ST CONG DIST: 06 * ______ __ *

CITY : EAST POINT ZIP: 30344 * ______ _____-____ *

CNTY NAME: FULTON CNTY CODE : 121 * ______ ___ *

LATITUDE : 33/37/30.0 LONGITUDE : 082/26/37.0 * __/__/__._ ___/__/__._ *

LL-SOURCE: R LL-ACCURACY: * _ _ *

SMSA : 0520 HYDRO UNIT: 03130002 * ____ ________ *

INVENTORY IND: Y REMEDIAL IND: Y REMOVAL IND: N FED FAC IND: N * _ _ _ _ *

NPL IND: N NPL LISTING DATE: NPL DELISTING DATE: * _ __/__ __/__ *

SITE/SPILL IDS: * __ __ __ __ __ *

RPM NAME: RPM PHONE: - - * ______ ___-___-____ *

SITE CLASSIFICATION: SITE APPROACH: * __ ___ *

DIOXIN TIER: REG FLD1: REG FLD2: 6 * ____ ______ _ *

RESP TERM: PENDING ( ) NO FURTHER ACTION ( ) * PENDING (_) NO FURTHER ACTION (_) *

ENF DISP: NO VIABLE RESP PARTY ( ) VOLUNTARY RESPONSE ( ) * _ _ *
ENFORCED RESPONSE ( ) COST RECOVERY ( ) * _ _ *

SITE DESCRIPTION:

* ______ *

* ______ *

* ______ *

* ______ *

M.2 - PROGRAM MAINTENANCE FORM

* ACTION: _ *

SITE: PRISMO UNIVERSIAL CORP

EPA ID: GAD088935960 PROGRAM CODE: H01 PROGRAM TYPE: * _ *

PROGRAM QUALIFIER: ALIAS LINK : * ___ __ *

PROGRAM NAME: SITE EVALUATION * ______________________________ *

DESCRIPTION:

* ____ *

* ____ *

* ____ *

* ____ *

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
C E R C L I S V 1.2

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: PRISMO UNIVERSIAL CORP
PROGRAM: SITE EVALUATION

EPA ID: GAD088935960 PROGRAM CODE: H01 EVENT TYPE: DS1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: E * _ ___ _ *

EVENT NAME: DISCOVERY STATUS: * ______________________________ _ *

DESCRIPTION:

* ____ *
* ____ *
* ____ *
* ____ *

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START:	* __/__/__	__/__/__	__/__/__ *
COMP :	COMP :	COMP : 11/01/80	* __/__/__	__/__/__	__/__/__ *

HQ COMMENT:

* ____ *

RG COMMENT:

* ____ *

COOP AGR #	AMENDMENT #	STATUS	STATE %
			0

* __________ __________ _ ___ *

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: PRISMO UNIVERSIAL CORP
PROGRAM: SITE EVALUATION

EPA ID: GAD088935960 PROGRAM CODE: H01 EVENT TYPE: PA1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: S * _ ___ _ *

EVENT NAME: PRELIMINARY ASSESSMENT STATUS: * ______________________________ _ *

DESCRIPTION:

* ____ *
* ____ *
* ____ *
* ____ *

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START: 09/22/86	* __/__/__	__/__/__	__/__/__ *
COMP :	COMP :	COMP : 09/22/86	* __/__/__	__/__/__	__/__/__ *

HQ COMMENT:

* ____ *

RG COMMENT:

* ____ *

COOP AGR #	AMENDMENT #	STATUS	STATE %				
			0	* __________	__________	__	___ *

M.2 - COMMENT MAINTENANCE FORM

SITE: PRISMO UNIVERSIAL CORP

EPA ID: GAD088935960

COM NO	COMMENT	ACTION
001	PART A- ON FILE	* _ ________________ *
		* ________________ *

M.2 - REGIONAL UTILITY MAINTENANCE FORM

SITE: PRISMO UNIVERSIAL CORP

EPA ID: GAD088935960

REG CODE: HSCS-01 * ACTION: _ *

DESCRIPTION: SOLVENTS (BENZENE TOLUENE) * ______________________________ *

* ______________________________ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * __________ *

REG CODE: HSC1-01 * ACTION: _ *

DESCRIPTION: ORGANICS * ______________________________ *

* ______________________________ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * __________ *

REG CODE: HSC9-01 * ACTION: _ *

DESCRIPTION: PAINT WASTE * ______________________________ *

* ______________________________ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * __________ *

M.2 - REGIONAL UTILITY MAINTENANCE FORM

SITE: PRISMO UNIVERSIAL CORP

EPA ID: GAD088935960

REG CODE: HTSO-01 * ACTION: _ *

DESCRIPTION: SURFACE WATER CONTAM. * ______ *

OBS. * ______ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * ______ *

REG CODE: OPDD-01 * ACTION: _ *

DESCRIPTION: DRUMS-ABOVE GROUND * ______ *

* ______ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * ______ *

REG CODE: OPDT-01 * ACTION: _ *

DESCRIPTION: TANKS * ______ *

* ______ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * ______ *

M.2 - REGIONAL UTILITY MAINTENANCE FORM

SITE: PRISMO UNIVERSIAL CORP

EPA ID: GAD088935960

REG CODE: OPD7-01 * ACTION: _ *

DESCRIPTION: SOIL CONTAM. * ______________________ *

* ______________________ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * __________ *

REG CODE: 4C85-01 * ACTION: _ *

DESCRIPTION: CERCLA FY 85 * ______________________ *

COOP. AG. * ______________________ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * __________ *

REG CODE: 4HRN-01 * ACTION: _ *

DESCRIPTION: PRELIMINARY HAZ. * ______________________ *

RANK. NEED. * ______________________ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * __________ *